IMPERIAL BUREAU OF ANIMAL HEALTH

THE

VETERINARY BULLETIN

Vol. 5.] **April, 1935.** [No. 4.

DISEASES CAUSED BY BACTERIA AND FUNGI.

PLASTRIDGE, W. N., ANDERSON, E. O., BRIGHAM, G. D., & SPAULDING, E. H. (1934). **Infectious Bovine Mastitis. 2. The Streptococci of Chronic Bovine Mastitis.**—*Bull. Storrs agric. Exp. Sta.* No. 195. pp. 19. 1 fig., 5 tables. [25 refs.] [For abst. of the previous article of this series, see this *Bull.* **4.** 406].

Of 208 strains of udder streptococci isolated from cases of chronic bovine mastitis, 204 were divided into two principal groups. Of these, 87 per cent., designated group A, had the characters of *Str. mastitidis* (*Str. agalactiae*); the majority were weakly haemolytic. This group was further divided according to ability to ferment glycerol, trehalose and salicin but repeat tests of strains kept in the laboratory and of successive strains from the same quarter showed that, with these test substances, results were not constant. With one exception animals infected with *Str. agalactiae* showed evidence of mastitis before or immediately after isolation of the organisms. 11 per cent. fell into a second group, further divided into three sub-groups. They differed from *Str. agalactiae* in fermenting mannitol and reducing methylene blue milk and caused only a mild form of mastitis from which the affected animals usually recovered in a few months to a year, contrasting thereby strongly with *Str. agalactiae.*—A. W. STABLEFORTH.

KLIMMER, M., & HAUPT, H. (1934). Untersuchungen über den gelben Galt. **[Investigations on Chronic Streptococcal Mastitis].**—*Arch. wiss. prakt. Tierheilk.* **68.** 81-111. 3 tables. [33 refs.]

The greater part of this article is a review of the authors' past publications, although references are made to the reports of other workers and some new work is reported, chiefly on the method of infection and on control.

Streptococcus agalactiae is by far the most common cause of chronic mastitis and the mastitis caused is the " gelbe Galt " of the milker. *Str. agalactiae* is today a well-established species, agreed by English, American, Danish, Austrian and German workers. The authors stress the advantages of their medium for its isolation.

Str. agalactiae is only found in affected udders and their secretion. The earliest symptom of infection is a galactophoritis, but in some cases the infection may be latent and no symptoms seen.

Spread occurs only by means of infected cows or secretion, and the only

portal of infection is the teat canal. Attempts to infect through the skin, including that of the udder, or through feeding, failed. On the other hand infection can be produced *via* the teat canal with very small numbers of streptococci. The infection is probably spread by the milker's hands – particularly by wet milking – or by contact of the teat opening with infected material such as is produced by the bad habit of stripping on to the ground. Experiments are quoted in which infected material was maintained in contact with the teat opening overnight (14 hours) by means of special bags. When one exposure was given about half the quarters became affected, but all were infected by seven to 14 exposures. Infection is in contrast difficult to produce by milking with infected hands. Incomplete milking is the most frequent auxiliary factor in producing clinical symptoms. Vaccination has neither curative nor preventive effects and in one experiment, in which three similar groups of about a dozen animals each received dead or living vaccine or were left as controls, the vaccinated animals showed finally a greater percentage of infection than the controls.

Curative measures are likely to be fruitful only if the disease is confined to the milk sinus and large ducts. Considerable clinical improvement can be obtained by thorough stripping. The injection of bactericidal agents *via* the teat canal is of value in early cases, the acridine dye " entozon " being preferred.

—A. W. STABLEFORTH.

ROEMMELE, & MEYER. (1933). Ueber die Reaktion der gelben Galtmilch und Betrachtungen über das pathologische Geschehen im Euter der kranken Tiere. **[The Reaction of Mastitis Milk and the Pathological Changes in the Udder of Affected Animals].**—*Milchw. Forsch.* **15.** 77-85. 2 tables. [14 refs.]

Normal milk is usually acid and never amphoteric. Secretion from quarters affected with mastitis has a high ratio of chloride to sugar and high non-protein nitrogen content. Acidity, when present, is due to excess of lactic acid, and is associated with lowered total phosphorus, citric acid, casein, lactose and calcium.

The alkalinity, which is the usual characteristic of mastitis secretion, is less easy to explain, but is probably due to an alteration of the phosphate buffers, a decrease of casein and of citric acid and the drawing of sodium bicarbonate from the blood stream. The composition of mastitis secretion has much in common with that of blood serum or lymph. The cure of mastitis must be effected by removing the cause and secondly by measures intended to restore the milk secretion to its normal plane.—A. W. STABLEFORTH.

ANGEVINE, D. M. (1934). **The Fate of Avirulent Hemolytic Streptococci Injected into the Skin of Normal and Sensitized Rabbits. Local Fixation of Bacteria.** —*J. exp. Med.* **60.** 269-285. 4 tables. [15 refs.]

The experiments were carried out on about 70 rabbits with a relatively avirulent haemolytic streptococcus which was injected intracutaneously in doses which gave counts usually between 40,000 and 700,000, about 4 cm. in front of the right inguinal lymph node.

In normal rabbits the numbers usually increased during the first five hours, but after 12 hours rapidly diminished and disappeared. They were also found in the right inguinal gland in 60 per cent., the iliac gland in 40 per cent., the spleen in 30 per cent., and blood in 6 per cent. of rabbits respectively. They were never obtained from the liver.

In rabbits, sensitized by previous repeated small intracutaneous doses, there was a more acute reaction, and in most instances larger numbers of streptococci

could be cultivated from the skin than in unsensitized rabbits. They were also more persistent. Streptococci were obtained in small numbers from the inguinal gland in 30 per cent. of rabbits, but in no case from the iliac gland, blood, spleen or liver.—A. W. STABLEFORTH.

SOKOL, A. (1934). Praktické poznatky o hříběcí. [**Practical Notes on Strangles (*Streptococcus equi* Infection)**].—*Zverolék. Obz.* **27.** 341-347. 3 figs., 3 charts.

In the author's opinion pathogenic streptococci are present in the bodies of healthy horses; when the resistance of the host is diminished, strangles may develop. Arecoline and pilocarpine were found most efficacious in the therapy of strangles on account of their stimulating effect on the lymphatic system. When combined with autohaemotherapy the curative effect of arecoline and pilocarpine increased markedly.

Foals can become infected with strangles when only one week old. In some cases of metastatic strangles the author found that an abscess weighing 18 kg. developed in one month; this knowledge is very important from the point of view of legal veterinary medicine.—E. PRIBYL (BRNO).

CURASSON, G. (1934). Le charbon bactéridien. Particularités étiologiques en pathologie exotique. [**Special Aetiological Factors in Tropical Anthrax**].—*Rec. Méd. vét. exot.* **7.** 105-114.

In general the prevalence of anthrax in tropical countries is associated with the onset of the rains and with the dry season. It is probable that the first is due to warmth and increase of humidity which lead to the vegetation of anthrax spores, and the second period to the drying of marshes with a concentration of anthrax organisms and, in part, to closer grazing of the remaining scanty pasturage and a concentration of cattle in valley areas.

There is considerable difficulty in preventing ignorant owners from eating the meat and selling the hides of infected animals, which leads to contamination of the soil and water; instances are on record in which infected hides were used as water vessels. Game again is an important agent of disease dissemination. Herbivorous game are susceptible to the disease and carnivorous mammals and birds excrete spores in their faeces after eating infected material. It has been proved that biting flies can transmit the disease from one animal to another, even with an interval of two hours between the feeds, while non-biting flies may carry organisms on their proboscides and feet, infecting wounds on animals on which they settle. The numerous termites of the tropics have, probably, also an important role in the dissemination of anthrax spores.—U. F. RICHARDSON.

HALL, G. N., & FORD, J. (1934). **Immunisation against Anthrax with a Saponified Culture.**—*Vet. J.* **90.** 446-454. 5 tables. [10 refs.]

Until 1932, anthrax in Nigeria had not necessitated the use of a vaccine. A spore vaccine prepared from a strain of Pasteur's second vaccine was first of all used, but later discarded as after storage the vaccine proved too potent. A vaccine was then prepared with saponin and it proved very effective for cattle, sheep and goats. A local reaction was set up, followed by immunity induced ten days or less after vaccination. It was shown to be safe for the most susceptible animals including those which were pregnant.

The vaccine consisted of a saline suspension of 1,000 million virulent organisms in 0·5 c.c., to which saponin was added to make the final concentration 2 per cent. The dose varied from 0·5 to 2 c.c. according to the species.

—GWILYM O. DAVIES.

WIGHT, A. E., FELDMAN, W. H., MOORE, W., BRANDENBURG, T. O., & ROBINSON, T. E. (1934). **Report of the Special Committee on Tuberculosis. [Amer. Vet. Med. Ass.]**—*J. Amer. vet. med. Ass.* **85.** 527-528.

The United States Bureau of Animal Industry reports that during the year ending June 30th, 1934, more tuberculin tests were carried out than during any previous year. The total number of herds tested was 1,256,039, containing 14,887,746 cattle. 232,150 animals (1·6 per cent.) gave positive reactions to the test.

In certain areas of the country there is a considerable incidence of tuberculosis in swine caused by avian strains of *Mycobact. tuberculosis*. Tuberculosis of poultry is very prevalent in the middle western and north central states. The avian strain is pathogenic not only for the fowl and other birds, but for other farm animals. The lesions in the fowl contain vast numbers of the organism, and these are particularly resistant to climatic conditions.—T. M. DOYLE.

I. LÜHRS. (1933). Die Bedeutung der tierischen Tuberkulose für den Menschen. **[Importance of Animal Tuberculosis for Mankind]**.—*Tierärztl. Rdsch.* **39.** 709-712.

II. SAVAGE, W. G. (1933). **The Mitchell Lecture on Human Tuberculosis of Bovine Origin.**—*Brit. med. J.* Nov. 18th. 905-910. 5 tables. [25 refs.]

III. WALKER, G. (1934). **On the Lack of Evidence of Transmission by Human Beings of Tuberculosis Due to the Bovine Type of Bacillus.**—*Ibid.* March 3rd. 371-373. [2 refs.]

I. This is a general article. Special mention is made of the dangers to which the human population is exposed in districts where there is a high incidence of bovine tuberculosis. In children the lesions occur in neck glands, abdominal glands or joints ; in the adult the lesions are generally present in the lungs. In the case of tuberculous children from non-tuberculous families, 83 per cent. were found to be infected with bacilli of bovine origin, while in tuberculous families 29 per cent. of the cases in children were due to infection with bacilli of bovine origin. Out of 16 cases of lung tuberculosis of the adult, four were due to bacilli of bovine origin. Foci in children may become encapsulated and remain so for years, but there is a tendency for the disease to flare up in later life. The course and form of lung tuberculosis so acquired in no way differs from that where infection is with bacilli of human origin.

II. Based on the findings of a number of bacteriologists, statistics on the incidence of human tuberculosis of bovine origin are given. The workers concerned carried out cultural and inoculation tests with the strains of tubercle bacilli which they had isolated from tuberculous patients. The observations suggest that an appreciable percentage of pulmonary tuberculosis of man can be ascribed to the bovine type of tubercle bacillus, and that direct air-borne infection can result in this form of the disease. It is stated that a study of the *post-mortem* findings in cases of tuberculosis due to the bovine type of organism demonstrates definitely that, in almost every case, infection is by way of the alimentary tract.

The author discusses the relative virulence of the human and bovine types of the tubercle bacillus for man, and states that there is no evidence to support the often asserted view that the bovine type is the less virulent. In tests, bovine strains are more virulent for all types of laboratory animals, and in the case of monkeys no difference in the virulence of the two types can be detected.

A considerable part of the article relates to bovine tuberculosis and dairy cattle, and the problems which must be faced to prevent the spread of tuberculosis from cattle to man.

III. The role which the bovine type of tubercle bacillus plays in the pathogenesis of human tuberculosis is discussed. At Glenlomond Sanatorium, 595 strains of the tubercle bacillus have been isolated from the sputa of cases suffering from pulmonary tuberculosis. Of these, 23 strains proved to be of the bovine type, and in one case a mixture of bovine and human types of bacilli was found. Special consideration was given to those cases in which the disease was due to the bovine type of organism. In four instances, more than one member of the family suffered from tuberculosis, but in only one was an opportunity for full bacteriological examination available. The author concluded that, although opportunities for contact infection did occur, there was no proof that the bovine type of tubercle bacillus spread from one human being to another. A feature of tuberculosis of bovine origin is the high incidence of glandular disease in children and the low incidence of visceral disease in later years. This suggests that the bovine type of organism has a lower invasive power than the human type and that extension beyond the lymphatic system occurs less readily. When the disease extends beyond the lymphatic system, the organism shows a high virulence and a tendency to produce multiple lesions and, in some cases, a marked degree of generalization.
—D. R. Wilson.

Nielsen, F. (1934). Genitaltuberkulosens kliniske Diagnose hos Koen. [**Clinical Diagnosis of Tuberculosis of the Genital Organs of the Cow**].—*Maanedsskr. Dyrlaeg.* **46.** 97-114.

The author describes tuberculosis of the genital organs. Uterine tuberculosis can only be diagnosed during life by means of rectal exploration. A distinction is made between various lesions that can be diagnosed by palpation, as follows :– (1) complete uterine tuberculosis ; (2) tuberculosis characterized by diffuse nodules from the size of a pea to that of a walnut in the uterine wall ; (3) apical uterine tuberculosis, and (4) cases in which the tuberculous processes are so slight that they cannot be palpated through the wall.

The diagnosis of lesions in the fallopian tubes, ovaries and adjoining parts of the peritoneum is discussed and the author considers that, after sufficient experience, this method yields reliable results.—H. C. Bendixen (Copenhagen).

Meyn, A., Breusch, E., & Weiske, G. (1934). Ueber das Vorkommen von Tuberkelbakterien im Blute tuberkulöser Rinder. [**Presence of Tubercle Bacilli in the Blood of Tuberculous Cattle**].—*Dtsch. tierärztl. Wschr.* **42.** 622-624. 1 table. [12 refs.]

Citrated blood was obtained from 150 cattle, most of which were suffering from generalized tuberculosis, at the time of slaughter or from the heart immediately afterwards. After haemolysis with distilled water and centrifugation one portion of the deposit was treated with sulphuric acid for five minutes and washed, and the other with 10 per cent. hydrochloric acid, centrifuged and used without washing. All samples were sown on Petragnani's medium and in the first 50 cases also on Feldman's medium and on Löwenstein's malachite green medium, three to five tubes of each medium being sown. Bovine tubercle bacilli were obtained in five cases. In seven other cases non-pathogenic acid-fast bacteria were obtained. Preference is given to treatment of the material with hydrochloric acid and the use of Petragnani's medium, on which macroscopic colonies were visible within five to seven weeks in all the positive cases.—A. W. Stableforth.

Datta, S. C. A. (1934). **The Position of Tuberculosis and Johne's Disease in India with Suggestions for the Best Methods to Adopt for their Diagnosis and Control.**—*Indian vet. J.* **11.** 93-98.

According to statistics there appears to have been an alarming increase in the incidence of tuberculosis (from 3 to 25 per cent.) within the past 15 years. Johne's disease is also wide-spread. Compared with Johne's disease in Europe, cases show a notable absence of clinical symptoms.

So far as the control of tuberculosis is concerned, it appears that Bang's method, with certain modifications, is the most suitable. In the control of Johne's disease, johnin is said to be inferior in value to avian tuberculin.

—Gwilym O. Davies.

Dubois, C., & Doutre, E. (1934). Fréquence de la tuberculose chez le veau. [**Frequency of Tuberculosis in the Calf**].—*C. R. Soc. Biol. Paris.* **116.** 1273-1276. [1 ref.]

125 calves, two to three months old at the most and of good quality, were subjected to the intradermal test for tuberculosis and, after the test, were slaughtered and examined. Of these, 119 gave a negative reaction and were found free from infection on *post-mortem* examination : the other six were positive and showed lesions of tuberculosis. The lesions in general were not very obvious and the authors consider that the very small incidence in the records of other authors might be due to an incomplete examination of the calf carcasses.—A. Brownlee.

Harshfield, G. S., & Roderick, L. M. (1934). **Avian Tuberculosis of Sheep.**—*J. Amer. vet. med. Ass.* **85.** 597-610. 3 figs., 5 tables. [10 refs.]

The authors record six cases of naturally contracted avian tuberculosis in sheep.

Case 1.—Extensive tuberculous lesions were present in the liver, lungs, spleen, mesenteric and body lymphatic glands and on the pleura and peritoneum. Inoculation of material set up characteristic lesions of tuberculosis in fowls and failed to set up lesions in guinea pigs.

Case 2.—Varying degrees of caseation and calcification were present in the bronchial, mediastinal, portal, cervical, mesenteric, renal, hepatic, crural, popliteal, prescapular and pharyngeal lymphatic glands.

Case 3.—Lesions present in the lungs and associated lymphatic glands, liver, spleen and on the peritoneum.

Case 4.—Lesions present in lungs, spleen, liver and on the pleura.

Case 5.—Lesions in the lungs and associated lymphatic glands.

Case 6.—Lesions in the lungs, liver and associated lymphatic glands.

In order to determine the susceptibility of sheep to artificial infection three lambs were inoculated intravenously with a suspension of a tuberculous liver from a fowl.

One lamb, when killed six months later, showed no macroscopic lesions ; in another, killed seven months after inoculation, there was generalized tuberculosis, and the third lamb, killed 16 months after inoculation, had caseocalcareous lesions in the bronchial, mediastinal, mesenteric and hepatic lymphatic glands.

In another experiment two out of three lambs were infected by multiple (ten) feeds of tuberculous livers and spleens from fowls.

Fifteen sheep were placed in contact with tuberculous fowls for one year and two of them contracted infection.

Sensitization to avian tuberculin was demonstrated in 20 of 21 artificially infected sheep. No reactions were obtained with mammalian tuberculin.

—T. M. Doyle.

MENKIN, V. (1934). **The Accumulation of Iron in Tuberculous Areas. IV. The Effect of Ferric Chloride on the Course of Tuberculosis in Reinfected Rabbits.** —*J. exp. Med.* **60.** 463-477. 6 figs. on 3 plates, 2 tables, 2 charts. [13 refs.]

Previous work showed that ferric chloride inoculated intravenously into tuberculous rabbits accumulated in the tubercles and retarded the course of the disease.

In this series of experiments, of ten rabbits inoculated subcutaneously with virulent bovine tubercle bacilli, five, receiving intravenously doses of ferric chloride solution over a period of four months, showed an average increased longevity of 89 per cent. over five untreated controls. Ten rabbits vaccinated with a relatively avirulent strain six weeks previously were given a dose of virulent culture, and the ferric chloride inoculations commenced at the time of the second inoculation in five of these and continued over a period of about four months. The ferric chloride treated animals lived 144 per cent. longer than the untreated controls.

Ferric chloride is a tissue irritant producing congestion and some degree of fibrosis in the lungs, which reaction may induce a greater resistance to the tubercle bacillus.—A. BROWNLEE.

STAFSETH, H. J., BIGGAR, R. J., THOMPSON, W. W., & NEU, Lisa. (1934). **The Cultivation and Egg-Transmission of the Avian Tubercle Bacillus.**—*J. Amer. vet. med. Ass.* **85.** 342-359. 7 tables. [17 refs.]

Fowls, artificially infected with material from a bird showing marked miliary tuberculosis, gave a positive reaction to the tuberculin test four to six weeks following inoculation. Birds given intramuscular inoculations became sensitized most readily. A few birds failed to react although infected. All eggs laid by the infected flock were examined and tubercle bacilli were isolated from 13·96 per cent. of 93 eggs laid. The infected eggs were laid by six hens (30 per cent. of the flock). Acid-fast granules and otherwise morphologically atypical organisms were recovered from eggs and from the reproductive organs, and the authors suggest that these granules represent stages in the life cycle of the tubercle bacillus. These acid-fast granules were found 36 to 57 days after artificial infection.

Cultures from apparently normal reproductive organs of tuberculous hens yielded growths of acid-fast organisms. Gross lesions of tuberculosis were found in the reproductive organs of three hens, two naturally and one artificially infected.

The hatchability of eggs from artificially infected hens was very low, 23·7 and 38 per cent. ; while attempts to prove that chicks may contract tuberculosis from eggs were unsuccessful.

Long's synthetic medium to which were added eggs and brilliant green gave the most abundant growth of the five media used, while Petroff's egg medium showed growth in a little shorter time than the others. A carbon dioxide tension of about 10 per cent. seemed to promote the growth of tubercle bacilli.

—R. F. GORDON.

SORDELLI, A., & ARENA, A. (1934). Interprétation de l'acido-résistance du *Mycobacterium tuberculosis*. [**Interpretation of the Acid-Fastness of *M. tuberculosis***].—*C. R. Soc. Biol. Paris.* **117.** 63-64.

Assuming that the acid-fast property of *Mycobacterium* is controlled by a membrane of a fatty nature, it is then supposed that the membrane is equally permeable to the fuchsin and acid solutions, but that its permeability is altered by the acid. Experiments with a non-acid-fast bacillus, *Salmonella typhi* (formerly *Bact. typhosum*), and cellophane membranes tend to support this theory, the cellophane acting as the membrane postulated as occurring in *M. tuberculosis*.

—R. LOVELL.

SAENZ, A., SADETTIN, M., & COSTIL, L. (1934). Etude de la toxicité comparée des solutions d'acide sulfurique et d'acide acétique pour les variétés R et S des Bacilles tuberculeux des Mammifères. [**A Comparative Study of the Toxicity of Sulphuric Acid and Acetic Acid on S and R Strains of** *Mycobact. tuberculosis*].—*C. R. Soc. Biol. Paris.* **117.** 308-311. 4 tables. [3 refs.]

The authors found that S and R types of *M. tuberculosis* of human and bovine origin and also an avirulent strain (BCG) behave similarly towards solutions of sulphuric and acetic acids as undissociated strains of the organism ; *M. tuberculosis* is sensitive to acetic acid but tolerant to sulphuric acid.—T. M. DOYLE.

PAGEL, W. (1934). **Histological Studies on the Variability of the Tubercle Bacillus.** —*J. Path. Bact.* **39.** 689-701. 10 figs. on 2 plates, 1 table. [45 refs.]

By staining different types of tuberculous foci with Giemsa stain, the author has demonstrated basophilic and eosinophilic forms of bacilli, the latter being associated with the character of inactivity or increased resistance, being particularly marked in killed cultures and in a snake strain, but absent from the smegma bacillus. The eosinophilic form is also related to the very young non-acid-fast elements. Comparative staining of sections of cultures reveals four different forms, namely, non-acid-fast granules and eosinophilic bacilli, chromophobe acid-fast bacilli not staining with Mallory's stain, chromophilic acid-fast bacilli staining intensely with Mallory's stain, and a basal chromophilic zoogloea. Chromophilic elements are plentiful in the rapidly growing " knob-like " cultures, but less frequent in the " wrinkled " variety, and dissociated (R and S) strains differ more in the distribution of chromophobe and chromophilic elements than in the amount. Virulence (as judged by the ability to proliferate and become pathogenic) and chromophilic character are not related, but the chromophilic element appears to cause a more severe local reaction after intracutaneous inoculation into guinea pigs.

—NORMAN HOLE.

MADDOCK, E. C. G. (1934). **Further Studies on the Survival Time of the Bovine Tubercle Bacillus in Soil, Soil and Dung, in Dung and on Grass, with Experiments on Feeding Guinea-pigs and Calves on Grass Artificially Infected with Bovine Tubercle Bacilli.**—*J. Hyg., Camb.* **34.** 372-379. 6 tables. [1 ref.]

The author has recorded in a previous publication [(1933). *J. Hyg., Camb.* **33.** 103.] that *Mycobact. tuberculosis* of bovine origin is capable of surviving for at least 178 days under field conditions when mixed with soil or faeces and soil mixed with faeces. The experiments described in the present publication were carried out a year later, when the weather conditions were different, being characterized by longer spells of heat and drought. In these conditions the longest period of survival was about 152 days.

Maddock considers that tuberculous material must, under average climatic conditions, be exposed for about six months before losing its virulence. During the autumn and winter months tubercle bacilli were shown to survive for 63 days after the infection of growing grass. Calves were infected by feeding on grass that had been repeatedly treated (four times at monthly intervals) with suspensions of the organism.—T. M. DOYLE.

ANANIADÈS, B., & PAPANARGHYROU, N. (1934). Recherches sur l'existence de la tuberculose d'origine bovine, chez l'Homme, à Salonique. [**Enquiry as to the Presence of Bovine Strains of** *Mycobact. tuberculosis* **in Human Beings at Salonika**].—*C. R. Soc. Biol. Paris.* **117.** 314-315. [4 refs.]

The authors made cultural examinations on Petragnani's medium of the tuberculous excretions of 375 persons aged up to 20 years. Three hundred cultures showed visible growths between the 10th and 59th days and 27 cultures gave growths between the 40th and 70th days which were discernible only by microscopic examination. All the strains isolated proved to be of the human type.

The authors attribute the absence of bovine strains to the fact that most of the milk consumed at Salonika is pasteurized.—T. M. DOYLE.

CLAWSON, B. J. (1934). **Experimental Vaccination with BCG.**—*Amer. J. Path.* **10.** 664-665. [34th Ann. Meet. Amer. Ass. Path. & Bact. March 29th & 30th].

The author carried out immunity experiments on rabbits with BCG. The animals were given four injections of 1 mg. each at weekly intervals by the following methods :–(1) subcutaneously with living organisms ; (2) intravenously with living organisms ; (3) subcutaneously with heat-killed organisms, and (4) intravenously with heat-killed organisms. Only microscopic lesions were induced and there was no evidence of their becoming progressive. The lesions were observed only in animals inoculated intravenously with living organisms.

The vaccinated animals when tested with 0·01 mg. of a virulent bovine strain had a greater length of life than the non-vaccinated, and generally the vaccinated showed a degree of specific resistance. The greatest degree of resistance appeared to be in the groups vaccinated subcutaneously with living organisms, and intravenously with the heat-killed organisms.—T. M. DOYLE.

FEDECKI, J. (1934). Stan nosacizny w b. rosji cesarskiej i w polsce zaboru rosyjskiego w swietle cyfr na przelomie dwóch stuleci. [**Glanders (*Pfeifferella mallei* Infection) in Russia and Poland at the End of the 19th and Beginning of the 20th Centuries**].—*Wiad. weteryn.* **13.** 298-301. [2 refs.] [Abst. from French summary].

In the territories of ancient Russia, which had no law controlling contagious diseases until 1902, the number of horses affected with glanders was as high as 0·4 per cent. In Russian Poland which had its own legislation against contagious diseases as early as 1844 the incidence of glanders, although high, was much lower than in Russia. Polish scientists were prevented from organizing a system of control by the Russian domination.—F. BULLOCK.

LESBOUYRIES, & BERTHELON. (1934). Pasteurellose des Bovidés. Essais de vaccination antipasteurellique. [**Vaccination against Bovine Pasteurellosis**]. —*Rec. Méd. vét.* **110.** 577-591. [1 ref.]

Bovine pasteurellosis is first surveyed from its historical aspect and references are made to the occurrence of the disease in different countries. Clinically, the condition is recognized by the prominence of respiratory disturbances and, *post mortem*, by a pleuro-pneumonia which seems to be an almost constant lesion.

Treatment with " novarsenobenzol " or " atoxyl " gives good results if given in the early stages of the disease. Success is also claimed for vaccination and it is said to be particularly useful for immunizing in-contact animals. The details of vaccine preparation are given.

[The subject of bovine pasteurellosis is a very confusing one, as the term is sometimes used to include all pasteurella infections of cattle and, at other times, in a more limited sense, to apply to a pasteurella pneumonia of cattle in order to distinguish it from haemorrhagic septicaemia or " barbone " as seen in Mediterranean countries, India, etc. *Pasteurella boviseptica* has been associated with both conditions.

In bovine pasteurella pneumonia, as described by JONES and LITTLE in America – (1921). *J. exp. Med.* **34.** 541. – and by TWEED and EDINGTON in Great Britain – (1930). *J. comp. Path.* **43.** 234. – the lesions, instead of being septicaemic in type, are more or less confined to the respiratory tract and the organisms isolated show no noteworthy pathogenicity. In haemorrhagic septicaemia, on the other hand, gastro-intestinal lesions, subcutaneous oedema, endocarditis and septicaemic changes are almost always present and the causal organism, which can be invariably isolated from the blood, is virulent for both cattle and rabbits.

In this paper, however, it appears as if the authors do not distinguish between these two forms, but use the term pasteurellosis to embrace all forms of pasteurella infections, including the English pasteurella pneumonia, in order to distinguish them from " other haemorrhagic septicaemias " presumably due to other than pasteurella organisms].—GWILYM O. DAVIES.

KUDO, M. (1933-1934). Studien über das Bacterium tularense. I. Ueber die Filtrierbarkeit des Bacterium tularense. II. Ueber einen verbesserten Nährboden für das Bacterium tularense (Eigelb-Serumnährboden). III. Die experimentelle Untersuchung über die Immunität gegen die Infektion mit dem Bacterium tularense. [**Studies on** *Pasteurella tularensis*. **I. Filtrability of** *Past. tularensis*. **II. An Improved Egg Yolk Medium for** *Past. tularensis*. **III. Immunity Experiments**].—*Jap. J. exp. Med.* **11.** 633-649 and **12.** 371-376 and 377-394. 18 tables. [37 refs.] [Orig. in German].

I. The filtrability of *Past. tularensis* was studied at pH 6·6 to 7·4, temperatures ranging between 10° and 20°C., negative pressures up to 22 mm. of mercury, and for periods of three minutes to 15 hours. Suspensions of pure cultures and infected tissue emulsions were tested. In the majority of experiments the organism passed through Berkefeld N, Chamberland L2 and Silberschmidt filters. In no instance did the organism pass Berkefeld W, Chamberland L3 or Reichel filters. Seitz discs gave variable results.

II. An improved medium composed of 60 per cent. egg yolk and 40 per cent. of horse or rabbit serum was prepared by coagulation and sterilization at 70° to 75°C. for an hour on three successive days. This medium proved superior to plain egg yolk, cystine-glucose agar, or glucose-rabbit blood agar for successful isolation and rapidity of growth of *Past. tularensis*. On this medium the organism retained its virulence after as many as 50 sub-cultures.

III. Active immunization of guinea pigs and mice was effected by the sub-inoculation of living or killed suspensions of *Past. tularensis*. Such immunity lasted at least six weeks. The injection of immune rabbit serum into guinea pigs or mice produced a passive immunity of short duration. A satisfactory, lasting immunity was produced by the combined treatment with immune serum and virulent organisms inoculated either simultaneously or at different times. Guinea pigs or mice infected with *Br. abortus* or with plague bacilli, or with antiserum against these organisms, were still susceptible to tularaemia.—E. J. PULLINGER.

BARNES, M. F., CASE, C. H., COTTON, W. E., WISNICKY, W., & KILLHAM, B. (1934). **Report of the Special Committee on Bang's Disease. [Amer. Vet. Med. Ass.]**—*J. Amer. vet. med. Ass.* **85.** 529.

The committee reports an increased interest shown by owners in measures for the control and eradication of contagious abortion. This is attributed to the low prices for milk and dairy products and the consequent necessity for eliminating all sources of loss. The committee reiterates that the blood test followed by the removal of reactors and the carrying out of hygienic measures is effective in

eradicating contagious abortion from herds. Reference is made to the indemnity now paid by the Federal Government for reacting animals, but details of the scheme are not given.—T. M. Doyle.

Huddleson, I. F. (1933). **Report of Research Associate Huddleson. [Brucellosis].**—*Rep. Div. Vet. Sci. Michigan State Coll. East Lansing, 1933.* pp. 32-43. 3 tables.

Huddleson surveys the investigational work on brucellosis carried out during 1933 at the Michigan State College. Immunity studies on cattle with a non-virulent living strain of *Br. abortus* were continued. The incidence of infection was based upon the recovery of the organism from either an aborted foetus or from the udder of an animal.

Summary of Results of Vaccination in 44 Herds. 1933.

Group.	Number of Breeding Animals Present.	Total Number of *Br. abortus* Abortions.	Per cent.	Total Number of Infected Animals.	Per cent.
Vaccinated	745	4	0·53	6	0·82
Control	162	4	2·5	6	3·7
Positive	272	38	14·0	106	38·9

Work was directed towards the finding of a method for the production of a therapeutic immune serum for use in human and animal infection. It was found that broth filtrates of brucella when injected intravenously into certain horses caused the development of brucella-immune opsonins; some horses do not respond to the injections of filtrates. A more potent opsonic serum was later produced by the intravenous injection of an autolysate fraction of the organism.

It would appear from the results obtained up to date that the injection of immune serum causes a temporary marked increase in the phagocytic power of the infected cow; the organisms disappeared from the udder of one cow and were considerably reduced in two others.

Studies were carried out of the therapeutic value of fractions of the cell on brucella infections in human beings and animals. Extensive chemical studies of brucella were carried out, comprising elementary and proximate analyses, growth requirements, sulphur metabolism, enzymes, polysaccharide, protein, nucleoprotein and other fractions.

Some work was undertaken on an allergic diagnostic test, but this investigation was temporarily suspended because it was considered that this test, in its present state, is not of practical application.—T. M. Doyle.

Priestley, F. W. (1934). **The Incidence in Great Britain of *Br. abortus* Infection in Various Domestic Animals as Indicated by the Agglutination Test.**—*J. comp. Path.* **47.** 181-189. 3 tables. [30 refs.]

The tube agglutination test was applied to the following sera obtained from the Metropolitan Cattle Market, London, as follows:—844 bovine sera (Group I), 366 bovine sera (Group II), 255 equine sera, 517 porcine sera and 348 ovine sera. 264 equine sera were obtained from army horses and 50 from a veterinary practitioner.

The technique is described and the results are set out in a table, showing the number of animals reacting to each titre in geometrical progression from 1 : 10 to 1 : 20,480. The first group of bovine sera was obtained from a section of the market where cattle of any age or sex are slaughtered and no data concerning these were obtained. The animals in Group II are classified into cows, heifers and steers. 27·5 per cent. of Group I could be considered to have reacted positively to the test, that is, to a titre of 1 : 40 or over. In Group II, 14 per cent. of the cows, 3·8 per cent. of the heifers and 0·9 per cent. of the steers reacted positively. Of the sera from horses killed for export, 14 per cent. were positive and 20 per cent. reacted to a titre of 1 : 20. Equine sera from other sources were positive in 14 per cent. and doubtful in 15 per cent. of the cases. A statistical examination of the relation of titre to age and sex in horses revealed no difference between the sexes, but there was a tendency to a higher titre with increasing age ; horses under four years of age were not examined.

The ovine and porcine sera were all negative.—R. S. Roberts.

Witte, J. (1934). Grundsätzliches über die Ursache und die Bekämpfung des ansteckenden Verwerfens des Rindes. [**Fundamental Conceptions on Bovine Contagious Abortion**].—*Dtsch. tierärztl. Wschr.* **42.** 569-576. 6 tables. [9 refs.]

Witte disagrees strongly with the views put forward by Wagener [(1933). *Berl. tierärztl. Wschr.* **49.** 709.] that abortion only becomes serious when environmental factors and feeding (e.g., foreign fodder) are unsatisfactory and production high. Basing his observations especially on six herds, which he details, where feeding and general conditions were similar, he emphasizes the fact that abortion is a specific contagious disease, usually brought into a herd by outside purchases and unconnected with feeding, and that measures for its control must be based on that fact. The course in different herds varies but general conclusions as to the reason can only be drawn from extensive data. The effect of feeding on sterility must be investigated in herds which are free from contagious abortion.

—A. W. Stableforth.

David, H. (1934). Zur Diagnose des Bangschen Rinderabortus mittels Schnellagglutinationsverfahren. [**Diagnosis of Bovine Contagious Abortion by the Rapid (Slide Agglutination) Method**].—*Wien. tierärztl. Mschr.* **21.** 193-201. [13 refs.]

Of 218 sera which were positive (definite agglutination at a dilution of 1:100 or over) by the test tube method, 216 were positive by the rapid slide method used, whilst one was doubtful and one negative. Of 17 sera which were doubtful (slight agglutination at 1:100 or definite agglutination below that dilution, details not given) ten were positive by the slide test, one doubtful and six negative, whilst of 115 sera which were negative to the tube test two were positive by the slide test and three doubtful.

The proportion of positive results obtained by the slide method was thus greater, whilst the doubtful results were definitely less and the negative results similar. The author concludes that it is therefore a suitable method of diagnosis.

Discussing the possibility of its use by practitioners, he believes that only by centralization of testing can good results be achieved, particularly because the numerous questions which must be answered in regard to eradication can only be done by those who are constantly dealing with this disease.

—A. W. Stableforth.

WITTE, J. (1933). Ueber die Verwertbarkeit der Meinicke-Klärungsreaktion (MKR) für die Diagnose des infektiösen Abortus des Rindes. II. Mitteilung. [**Use of Meinicke's Clearing Reaction for Diagnosis of Contagious Abortion. II**].—*Berl. tierärztl. Wschr.* **49.** 727-729. [6 refs.]

Continuing his earlier work [this *Bull.* **2.** 272.] on a further 752 sera Witte concludes that Meinicke's test is simple, sensitive and specific, better than Menck's modification and a suitable control test to the agglutination test. He observes that it gives a greater percentage of positive results than the agglutination test and remains positive longer in a given animal. [The lowest agglutination titre regarded as positive was, however, 1:100 and most of the sera which are classed as giving a negative agglutination and positive Meinicke (MKR) actually had a titre of 1:50 or 1:25].—A. W. STABLEFORTH.

SANDNER, L. (1934). Beiträge zur Feststellung der Bang-Infektion beim Meerschweinchen mit der Frischblutschnellagglutination. [**Diagnosis of** *Br. abortus* **Infection in Guinea Pigs by the Rapid Fresh Blood Agglutination Test**].—*Inaug. Diss. Munich.* pp. 48. 11 tables. [86 refs.]

From a comparison between a rapid agglutination method carried out with fresh blood and the ordinary tube method, Sandner concludes that the rapid method used is of no value for the early diagnosis of infection in guinea pigs because it fails to detect a large percentage of samples which by the tube method are positive. Blood was obtained from 640 infected guinea pigs and from 96 normal guinea pigs. All of the latter gave negative results. The rapid method detected all positive blood samples whose serum had a titre of 1 : 400 or over, but failed to detect 25 to 100 per cent. of those which had a titre of 1 : 100 or below. One drop of blood was mixed with one drop of 0·4 per cent. oxalate solution and one drop of suspension, the latter being made by adding distilled water to one-sixth of its volume of centrifuged deposit. No difference was found in several antigen strains tested.—A. W. STABLEFORTH.

KILLHAM, B. J. (1934). **Results of Compulsory Tests for Bang's Disease.**—*J. Amer. vet. med. Ass.* **85.** 664-668. 3 tables. [2 refs.]

The author was provided with the opportunity of studying the general incidence of bovine contagious abortion in Jackson County, Michigan. This was the result of the passing of a regulation prohibiting the sale in Jackson City of milk other than that from cows which had passed an approved blood test. 4,382 cattle were tested out of an estimated population (cows and heifers) of 13,145. The tests revealed 10·7 per cent. positive, 6·7 per cent. suspicious and 82·6 per cent. negative ; 44 per cent. of the herds contained reactor animals.

Killham emphasizes that too much reference is being made to the act of abortion in connection with the disease. Many owners of heavily infected herds claim that abortions are relatively rare over periods varying from two to five years.
—T. M. DOYLE.

VAN OYEN, C. F. (1934). Die Bekämpfung der Abortus-Bang-Infektion durch Ausmerzung der bakterienausscheidenden Tiere. [**Control of Contagious Abortion by the Segregation of Animals which excrete** *Br. abortus*].—*Dtsch. tierärztl. Wschr.* **42.** 457-460. 4 tables.

The main purpose of this article is to suggest, on the basis of observations in two herds, that it is unnecessary to segregate all animals whose blood serum is positive, but sufficient to segregate strictly only those animals whose whey is also positive and which are therefore actually likely to be excreting *Br. abortus*. A

positive blood reaction unaccompanied by whey agglutinins generally drops. Of 800 negative samples of whey only one was shown to be from a milk which contained *Br. abortus*, whilst titres of 1 : 20, 1 : 50, 1 : 100, 1 : 200 and 1 : 500 or over were correlated with 5·7, 9·5, 25, 48 and 66·7 per cent. of positive cultural findings respectively.—A. W. Stableforth.

Cotton, W. E., Buck, J. M., & Smith, H. E. (1934). **Further Studies of Vaccination during Calfhood to prevent Bang's Disease.**—*J. Amer. vet. med. Ass.* **85.** 389-397. 2 tables. [1 ref.]

The authors carried out a vaccination experiment against contagious abortion using 33 calves aged from four to six months ; 17 of the animals were vaccinated and 16 kept as controls. Nine animals were vaccinated with an attenuated strain of *Br. abortus* and eight were vaccinated with a virulent strain.

The vaccines were adjusted to a density ten times greater than that of tube I of the McFarland nephelometer and each animal was given 10 c.c. subcutaneously, 5 c.c. on each side of the neck.

When the animals were proved to be in-calf, both vaccinated and controls were exposed to infection *via* the conjunctiva by instilling three to four drops of a virulent culture of *Br. abortus*.

Sixteen of the vaccinated heifers produced strong calves and one a weak calf. Of the 16 controls, seven aborted and three produced weak calves. The remaining six controls produced strong calves, but *Br. abortus* was isolated from the uterus and colostrum of one and from the colostrum of another—T. M. Doyle.

I. Elder, C. (1934). **The Relation of Abortion or Bang's Disease to Mastitis.** —*J. Amer. vet. med. Ass.* **85.** 638-644. [13 refs.]

II. Frei, W. (1934). Beziehungen zwischen Mastitis und Banginfektion beim Rind. [**Relationship between Mastitis and** *Br. abortus* **Infection in Cattle**]. —*Schweiz. Arch. Tierheilk.* **76.** 497-503.

I. From a brief review of the literature and from a small number of his own observations, Elder concludes that *Br. abortus* is not an important factor in the production of gross lesions in the udder but that it may act as a predisposing cause to infection with streptococci or other bacteria which cause serious mastitis.

II. Frei concludes from a comparison of the frequency of a whey agglutination titre for *Br. abortus* of 1 : 40 or over, and the presence of streptococci or other evidence of mastitis in 1,219 samples of milk examined in 1932 and 1933, that brucella infection is a predisposing cause of mastitis, and that *vice versa* the excretion of brucella agglutinins is favoured by the damage caused to the cells of the udder by mastitis. The correlation is not, however, striking. [See also this *Bull.* **5.** 117].—A. W. Stableforth.

Thompson, R. (1934). **Elimination of Brucella abortus with the Milk of "Carrier" Cows.**—*J. infect. Dis.* **55.** 7-11. 3 tables. [18 refs.]

The milk of ten apparently normal high producing cows, which had never aborted but whose serum agglutinated *Br. abortus* at from 1 : 50 to 1 : 500, was examined for the presence of *Br. abortus* at intervals of 30 days, over periods of lactation varying from two to 12 months. The methods used were plate culture on liver agar, with and without added carbon dioxide, and the inoculation of guinea pigs.

The results obtained by the cultural method and by guinea pig inoculation were nearly always similar, but in four cases brucella were obtained only through guinea pigs. Six animals, five of which had a titre of 1 : 80 or over, were more

or less constantly excreting *Br. abortus*, the frequency with which it was isolated varying from nine out of ten occasions to two out of eight. Four animals whose titre was 1:50 to 1:80 gave negative results at three to ten successive tests.

—A. W. Stableforth.

Bischoff. (1934). Ueber einen Versuch, durch die Anwendung des Dr. Volkmar'schen Verfahrens die Ausscheidung von Bang-Bakterien mit der Milch der Kühe zu beseitigen. [**An Attempt to Stop Excretion of** *Br. abortus* **in the Milk by Volkmar's Method**].—*Dtsch. tierärztl. Wschr.* **42.** 553-555. 4 tables.

The method, which consists of the intravenous injection of a mixture of various salts, had no effect on the agglutination titre of the blood or whey, or on the excretion of *Br. abortus* in the milk.—A. W. Stableforth.

Pedersen, H. O. (1934). Undersøgelser over Abortinfektionen i Yveret hos Koen. [**Researches into** *Brucella abortus* **Infection of the Cow's Udder**].—*Skand. VetTidskr.* **24.** 409-438. 6 tables. [18 refs.] [English summary: abst. from orig.]

After centrifugation of 10 c.c. of milk for 20 minutes (4,500 R.P.M.) the author found *Br. abortus* more frequently in the sediment than in the cream layer. Also, in most cases a greater number of bacteria was found in the last portion of the milk than in the first milk. Forty-five quarters in 12 cows were examined. Eighteen quarters excreted *Br. abortus* in pure culture; eight contained *Br. abortus* and corynebacteria, four contained *Br. abortus* and staphylococci; three contained *Br. abortus* and streptococci; three contained staphylococci alone, two streptococci alone, and seven were free from any bacteria. Thére were no demonstrable macroscopic disturbances of the secretion in any of the 11 quarters in which *Br. abortus* was in pure culture. In four quarters a moderate increase of the amount of cells in the last portion of the milk was demonstrated. In one quarter the milk contained excess chloride. Whether this can be ascribed to *Br. abortus* is uncertain, as the other three quarters were infected with streptococci.

One cow, in which only three quarters yielded milk, excreted *Br. abortus* in pure culture from both rear quarters. A disturbance of the secretion was demonstrated here in the shape of increased amount of chloride and cells. The alterations were most severe about two and a half months after calving, when the milk of the right posterior quarter was of a weak, watery appearance. This was the case at the same time with the right fore quarter, which excreted staphylococci and *coli*-like bacteria as well as *Br. abortus*.—H. C. Bendixen (Copenhagen).

Plate, G. (1934). Die Feststellung von Brucella abortus in der Milch bei der Milchüberwachung. [**The Demonstration of** *Br. abortus* **in Milk**].—*Dtsch. tierärztl. Wschr.* **42.** 537-543. 8 tables, 2 charts. [10 refs.]

The rapid slide agglutination method carried out with whey is satisfactory and accurate and suited to the examination of large numbers of samples in routine milk control. A weakly positive result (±, = delayed and incomplete agglutination) was correlated into an average titre of slightly under 1 : 20 by the tube method, a positive result (+, = definite agglutination within a few seconds of mixing with suspension) with a titre averaging 1 : 40 to 1 : 80 and a marked positive usually into a titre of 1 : 80 or over. The scatter was, however, wide.

413 samples of mixed milk from individual cows were examined. Of 278 negative samples, or samples which gave non-specific clumping, none showed brucella by guinea pig inoculation (one animal). Of 28 weakly positive samples,

12·1 per cent. contained brucella (2 animals); whilst of 49 positive samples, and 53 which gave a pronounced reaction, 61·2 and 88·7 per cent. respectively showed brucella.

842 group samples were examined: 709 negative samples gave brucella in 2·3 per cent., 35 which showed non-specific reaction gave brucella in 2·7 per cent., whilst 40 weakly positive samples, 52 positive samples, and 6 markedly positive samples gave 7·5 per cent., 32·7 per cent. and 50 per cent. respectively.

Group samples which only reacted at 1 : 10 by the tube test, gave brucella in only 3·7 per cent., whilst comparable samples from single cows gave brucella in 10·5 per cent.

Group samples are regarded as unsatisfactory for the detection of cows excreting brucella. The rapid method makes it possible to examine samples from each cow, doubtful and positive results being confirmed by the tube method. Positive milk samples should be finally examined by guinea pig inoculation or culture. Negative samples should be mixed and further tested in guinea pigs.

—A. W. Stableforth.

Plate, G. (1933). Der beschleunigte, direkte Nachweis der Brucella abortus in der Milch mit Hilfe des Meerschweinchenversuches. [**Rapid Demonstration of *Br. abortus* in Milk by means of Guinea Pigs**].—*Inaug. Diss. Hanover.* pp. 68. 13 tables. [80 refs.]

The first 27 pages are given to introduction and a concise review of the literature regarding the occurrence and recognition of *Br. abortus* infection in milk by cultural, serological and biological methods. Plate's own work was particularly designed to test the value of Schönberg's method for hastening the diagnosis of brucella infection in guinea pigs by culture of the extirpated lymph gland.

Of 81 milking cows whose blood or whey or both were already known to agglutinate *Br. abortus*, 56 (69·1 per cent.) were shown by direct culture or guinea pig inoculation to be excreting *Br. abortus*. Only nine were detected by direct culture on 1 : 100,000 gentian violet agar, whilst 54 were detected by means of one or two guinea pigs. Of a total of 97 injected guinea pigs, 63 (64·9 per cent.) were positive; 56 were detected by agglutination tests made with blood serum, a titre of 1 : 30 or over being regarded as positive; 52 by culture of extirpated glands 18 days after inoculation when 17 only were serologically positive, and 55 by *post-mortem* findings and culture of liver, spleen or lymph glands. The lymph gland findings were always confirmed by subsequent positive serological results, when the animal did not die prematurely. They were negative in nine animals which became serologically positive.

Extirpation of lymph glands is, therefore, regarded as a valuable method of hastening results but in negative cases should be confirmed by later serological tests.

Of 52 positive cultures, 50 were detected by incubation in coal gas and 30 by incubation in anaerobic jars under reduced oxygen tension; incubation in symbiosis with *Chromobact. prodigiosum* was unsatisfactory. Cultures made on foal-flesh-agar incubated in coal gas detected only 16 out of 21 positive results.

96 per cent. of cows which were excreting *Br. abortus* had a blood titre of 1:200 or over; 98 per cent. had a whey titre of 1:50 or over.

The original should be consulted for details which are well presented.

—A. W. Stableforth.

Olin, G., & Lindström, B. (1934). Vergleichende Untersuchungen über verschiedene Brucellatypen, besonders solche schwedischen Ursprungs.

[Comparison of the Brucella Strains, Particularly those of Swedish Origin]. —*Zlb. Bakt. I. (Orig.).* **131.** 257-275. 1 fig., 8 tables. [38 refs.]

Eighty-three brucella strains isolated from cases of undulant fever in Sweden were compared with 20 previously classified strains, ten bovine *abortus*, six porcine *abortus* and four *melitensis* strains. All the Swedish strains showed themselves, by serological tests and dye inhibition tests, together with the hydrogen sulphide and glucose utilization tests and their pathogenicity for guinea pigs, to be of the bovine variety.

Discussing the relative values of the various means used for classification, Olin and Lindström found that agglutinin-absorption tests showed a distinct difference between bovine and porcine *abortus* on the one hand and *melitensis* on the other. Two *melitensis* strains showed, however, a preponderance of the *abortus* (A) antigen. The use of " monospecific " sera (Wilson and Miles) confirmed these results.

The dye inhibition method of differentiation is said to have given the best and safest results.

Production of hydrogen sulphide agreed with the conclusion of other workers, except that one *melitensis* strain produced a large quantity, and three Danish porcine strains failed to produce hydrogen sulphide.

Utilization of glucose was slight by all types and the test was of no value for differentiation. It is also concluded that pathogenicity for the guinea pig is not a safe method of differentiation.

Of white mice given a subcutaneous inoculation of killed culture, 60 per cent. survived a subsequent intraperitoneal test, but the protection was equally useful against all varieties of brucella.—A. W. Stableforth.

Topping, Lucy E. (1934). **Carbohydrate and Nucleoprotein Fractions Isolated from the Brucella Group.**—*J. Path. Bact.* **39.** 665-668. 2 tables. [14 refs.]

Carbohydrate fractions which were essentially the same were isolated from a smooth strain of *Br. abortus* by a modification of Zinsser and Parker's method [(1923). *J. exp. Med.* **37.** 275.] for " residue antigens " and by Heidelberger and Avery's method [(1923). *J. exp. Med.* **38.** 73.] for the carbohydrate of Type II pneumococci. The properties of the former which are tabulated showed that it was a practically protein-free polysaccharide which gave ring precipitates with *Br. abortus* and *Br. melitensis*, in both cases at 1 : 2,000. Nucleoprotein fractions were obtained from both *Br. abortus* and *Br. melitensis* and reacted similarly with sera made with each organism.

The author notes that Favilli and Biancalani also recorded non-type-specific carbohydrates which reacted only in low dilutions whilst Huddleson and his co-workers reported (without, however, giving details) the presence of two polysaccharides in *Brucella*, one in *Br. abortus* and another in *Br. melitensis*, both of which were present in porcine *abortus*. She believes that the biological inactivity of Huddleson's products both *in vivo* and *in vitro* was due to the method of preparation.—A. W. Stableforth.

Lisbonne, & Seigneurin. (1933). Sur l'électrophorèse des *Brucella*. **[Electrophoresis of the Brucella Group].**—*C. R. Acad. Sci. Paris.* **196.** 1747-1748. 1 fig.

The migration velocity of well-washed bacterial cells of the brucella group was examined, the organisms being obtained from different sources (human, bovine, caprine and ovine) and prepared under identical conditions. It was found that the migration velocity did not agree with the classification of the organisms

according to the method of Huddleson, i.e. whether they were *Br. melitensis* or *Br. abortus*, but that they all fell into well-marked classes according to their origin. Thus the migration velocities, expressed in μ per second, obtained under the conditions of experiment were :– strains of bovine origin 1·8 to 2·2, strains of human origin 1·0 to 1·4, those of caprine origin 1·25 to 1·35 and those of bovine origin 0·66 to 0·74 in an electrostatic field of 13 volts per cm. Owing to the agreement between the migration velocities of the human and caprine strains, it is suggested that virulence may be connected with electric charge.

—W. R. Wooldridge.

Tuttle, C. D., & Huddleson, I. F. (1934). **Oxidation-Reduction Studies of Growth and Differentiation of Species of Brucella.**—*J. infect. Dis.* **54.** 259-272. 9 figs., 4 tables. [4 refs.]

Sticks of special graphite are suitable for use as electrodes for measuring oxidation-reduction intensity of bacteria grown in sterile liquid culture medium under aerobic conditions. Using a sterile beef liver broth it is shown that cultures of the bovine and porcine types of *Br. abortus* and of *Br. melitensis* lead to approximately the same fall in the value. When thionine is present the growth of the bovine type of *Br. abortus* is inhibited and the fall in potential is less than that produced by the other two organisms, the fall being somewhat less with *Br. melitensis* than with the porcine type. If, however, basic fuchsin is present, then the latter organism is inhibited and the fall of potential of this medium is negligible whilst the fall in the presence of *Br. melitensis* and the bovine type of *Br. abortus* is considerable and about equal (e.g. from +0·3218 to +0·1638 volts). Only two strains of each organism were examined.—W. R. Wooldridge.

Hall, I. C., & Learmonth, R. (1934). **Institutional and Occupational Undulant Fever in Colorado.**—*J. infect. Dis.* **55.** 184-189. [23 refs.]

An account of tests carried out on the dairy herd maintained by an asylum, in which cases of undulant fever occurred.

Agglutination tests of blood serum were found to be superior to tests of milk as only 30 per cent. of serum reactors revealed agglutinins in the milk.

According to the authors, there is much greater risk of infection through handling infected meat than through drinking infected milk. Nevertheless, all milk should be pasteurized as a safeguard.—Gwilym O. Davies.

Buhl, K. (1934). Tetanus beim Rinde. [**Tetanus in Cattle**].—*Tierärztl. Rdsch.* **40.** 739-743. 1 fig. [12 refs.]

Nine cases of tetanus in cows are described. Cases can be diagnosed clinically from a fairly clear-cut train of symptoms. These commence with digestive disorders, movements of the rumen and rumination being in abeyance. Tympanitis results. Stiffness of the tail is then noted followed by spasms of various muscle groups. Prognosis is doubtful. Any of the recognized forms of treatment may be tried.—E. J. Pullinger.

Haupt, H. (1934). Zur Frage der Verwandtschaft des Actinobacillus Lignieresii Brumpt 1910, des Bacillus equuli van Straaten 1918 und des Bacillus mallei Flügge 1886. [**Relationship of** *Actinobacillus lignieresii*, *Bact. equirulis* **and** *Pfeifferella mallei*].—*Arch. wiss. prakt. Tierheilk.* **67.** 513-524. 4 tables. [16 refs.]

Strains of *A. lignieresii* and *Bact. equirulis* (synonyms *B. nephritidis equi*, *Bact. viscosum equi*, *B. pyosepticus equi*, *Shigella equirulis*) were compared biochemically

and serologically. The strains were also compared serologically with *Pf. mallei*. Fermentation tests using a large number of carbohydrates revealed that whilst strains of each species showed minor variations, in general the reactions of both species were remarkably similar. For serological tests, antisera were prepared from rabbits, the preparation of the various antigens being described. Strong anti-*A. lignieresii* sera failed to agglutinate four *Bact. equirulis* strains, agglutinated one strain to a low titre, and another strain to the full titre. Anti-*Bact. equirulis* sera agglutinated *A. lignieresii* strains at low titres. *Pf. mallei* antiserum agglutinated strains of both species at a low titre. Absorption tests showed that only one strain of *Bact. equirulis* could lower materially the titre of anti-*A. lignieresii* serum for its homologous antigen ; whilst absorption with *Pf. mallei* failed to lower the titres of either anti-*A. lignieresii* or anti-*Bact. equirulis* sera. The titres of anti-*Bact. equirulis* sera were only lowered when absorbed by the actual strain of *Bact. equirulis* with which the particular serum had been prepared. Fixation of complement occurred when one particular sample of anti-*A. lignieresii* serum was combined with any strains of *Bact. equirulis* or *Pf. mallei*. Otherwise the complement-fixation results agreed fairly closely with those obtained from agglutination tests.

—E. J. Pullinger.

Schellner. (1934). Die Bakteriologie des Blutes kolikkranker Pferde. [**Blood Bacteria of Horses with Colic**].—*Tierärztl. Rdsch.* **40.** 37-42, 56-59 and 75-77. 5 tables. [28 refs.]

Cultures were made from the blood of 40 horses affected with colic, of which 16 recovered and 24 died or were killed *in extremis*. In all cases but one, the blood was sterile ; in the single positive case, streptococci and *Bact. coli* were found.

Blood culture tests were also carried out on four experimental horses in which artificial intestinal obstruction or perforation was produced. Blood samples were taken every two hours until death occurred, after 23 hours or earlier. Streptococci were found in six samples and streptococci and *Bact. coli* in 18 samples.

This work tends to show that the tissues of horses killed when suffering from colic may occasionally contain pathogenic bacteria.

—W. von Düring (Wilmersdorf).

Bruner, D. W. (1934). **Influence of Nutritive Conditions on Acid-Fastness of Bacteria.**—*J. infect. Dis.* **55.** 26-38. [17 refs.]

Non-acid-fast Gram-positive and Gram-negative bacteria were grown, with many transfers, in media rich in butter fat or in oleic acid. It was shown that the acid-fast appearance found by Campbell (1925) was entirely due to the protective action of the fatty substances in pieces of media which might contaminate the film.

Eight types of saprophytic acid-fast bacteria were used in experiments designed to find out if acid-fast organisms could be converted into non-acid-fast types. Acid-fast bacteria require for their active growth media containing substances rich in carbon. Glycerol is the substance usually employed to supply this need. When these bacteria were grown on and repeatedly subcultivated on to media devoid of carbon-containing substances, only slight growth occurred, with a varying, usually large, percentage of non-acid-fast forms, indicating that the deficiency in carbon prevented the normal formation of the lipoid substance to which the acid-fast property is due. No growth occurred on such media when incubated in a carbon dioxide free atmosphere. After growing these bacteria for many generations on the various deficient media, subcultivation again on to media containing glycerol resulted in a normal growth of acid-fast organisms.

Attempts were made to produce non-acid-fast types by rapid subculture, as

it was believed that very young cultures are not so acid-fast as older ones. It was found that rapid subcultivation did not lead to a greater percentage of non-acid-fast forms than did subcultivation at longer intervals.

Although acid-fast bacteria may be regularly cultivated from garden soil, it is difficult to demonstrate them by film examination. Extracts of garden soil were made and inoculated with acid-fast organisms, and it was found that in such cultures a large percentage of forms were non-acid-fast, suggesting that typically acid-fast organisms may live in soil in a non-acid-fast form.

Growth in the presence of hydrochloric acid, lipase, saponin or neutral fuchsin, was not found to inhibit acid-fastness, as has been supposed by some workers. —A. Brownlee.

Olitzki, L. (1934). **Electric Charge of Bacteria Sensitized with Purified Agglutinins.**—*J. Immunol.* **27.** 105-112. 3 tables. [13 refs.]

Electrophoretic experiments were carried out with two strains of *Proteus*, viz. HX 19 and HX 2 which possess a common H and specific O agglutinins. At pH values above 4·0 the H forms of *Proteus* show a higher migration velocity to the anode than the corresponding O forms. Agglutination with pure H agglutinin or with pure O agglutinin reduces the charge of the agglutinable H or O forms respectively, but does not affect the inagglutinable O or H forms. Agglutination with sera containing both types of agglutinins reduces the charge of all cells present in the suspension. The migration velocity of H forms was unaffected by the addition of H agglutinin below pH 4·0 as the H antigen was destroyed at this acidity. No cathodic migration of O forms treated with O agglutinin and washed free from serum took place below pH 4·0, but if foreign amphoteric proteins were not removed by washing the cells took on the positive charge of these proteins, if large amounts had been used.—W. R. Wooldridge.

Lasseur, P., Dupaix-Lasseur, A., & Renaux, M. A. (1934). Variation de l'opacité des suspensions bactériennes en fonction de pH et de la nature des solutions modificatrices de la réaction du milieu. [**Variations in Opacity of Bacterial Suspensions According to the pH**].—*Trav. Lab. Microbiol. Nancy.* No. 7. 153-169. 5 figs., 1 plate, 3 tables. [1 ref.]

This paper gives an account of experiments undertaken to determine how far the opacity of bacterial suspensions is influenced by the pH concentration. References are given to previous research work on this subject using suspensions of non-pathogenic Gram-positive and Gram-negative organisms. The effect of the pH on the opacity of suspensions varied with the organism studied.

—Gwilym O. Davies.

Hoyle, L. (1934). **A Method of Raising and Maintaining the Virulence of Influenza Bacilli, with Some Observations on the Pathogenic Properties of Virulent Strains.**—*J. Path. Bact.* **39.** 681-687. 2 figs. on 1 plate, 1 table. [6 refs.]

A broncho-pneumonia occasionally results when rabbits and guinea pigs are inoculated intratracheally with influenza bacilli, the virulence of the organisms becoming increased in the process. It has also been shown that broncho-pneumonia can be constantly produced by intrapleural inoculation of strains of raised virulence. The virulence can be maintained by intrapleural passage in rabbits.—R. Lovell.

DISEASES CAUSED BY PROTOZOAN PARASITES.

CERRUTI, C. G. (1934). Recherches systématiques sur les hémoprotozoaires des animaux domestiques de la Sardaigne. [**Systematic Research on the Blood Protozoa of Domestic Animals in Sardinia**].—*Boll. Sez. ital. Soc. int. Microbiol.* **6.** 329-338. [In French].

Babesia berbera, which the author distinguishes from *B. bovis* by the absence of parasites with a marginal situation in the blood corpuscles, is common in the plains and the coastal areas of Sardinia, but is rare in the Province of Sassari. The parasite is responsible for one of the most wide-spread and serious diseases of cattle in Sardinia. The organisms are present in the blood in small numbers, but are numerous in the internal organs, particularly in the myocardium and kidneys.

B. bigemina infection is fairly common in parts of the island. Pear forms predominate in the blood, and about 10 per cent. of corpuscles are usually affected. *Theileria annulata* is said to be present and to cause a disease resembling infection with *Th. dispar* in Algeria. This organism occurs in the blood in numbers which vary with the stage of the disease, but the organisms may be more numerous than the blood corpuscles. *Th. mutans* infection is wide-spread. The organism is not pathogenic, and is said to be always rare in both the blood and internal organs.

B. ovis exists in Sardinia but has not been encountered in association with disease. *Th. recondita* has been detected in sheep after splenectomy. *Anaplasma ovis* has been encountered in two outbreaks of serious disease associated with anaemia, jaundice, enlargement of the spleen and degeneration of the liver.

In horses both *B. equi* and *B. caballi* have been encountered ; imported horses are usually attacked.

Dogs harbour *B. canis* and *Leishmania canis*, whilst in pigs a disease has recently been encountered associated with a piroplasm which resembled *B. bigemina*, but has not yet been fully investigated.—U. F. RICHARDSON.

RANDALL, R. (1934). **Studies in Surra, II. Pseudoreactions in Complement-Fixation Tests for Trypanosomiasis.**—*Philipp. J. Sci.* **54.** 29-42. 6 tables. [9 refs.]

In the Philippine Islands, *Tryp. evansi* is the only pathogenic type of trypanosome which is known to exist, and the complement-fixation test has been utilized to detect infection in suspected horses which are negative to microscopic examination. On a test of 451 horses and mules which had been recently imported, 30 weak positive reactions were given, and it was found that the same sera gave parallel results with beef heart antigen and, to a less extent, with equine abortion and glanders antigens, indicating that the reactions were non-specific. Over 50 per cent. of the sera giving these pseudoreactions were obtained from animals during, or shortly after, an acute febrile condition of unknown origin. It was shown that such sera contained a thermostable antilytic substance which was present in both the globulin and albumen fractions of the serum proteid. No native complement could be demonstrated and it was found that the addition of inactivated guinea pig serum markedly reduced the antilytic property.

The pseudoreactions were largely excluded by a modified technique in which the complement was increased (two exact units) but, with sera giving weakly positive reactions, it was found essential to determine the antilytic titre by titrating with graduated doses of complement and two units of haemolysin in the absence of antigen.

Some interesting notes on the reliability of guinea pig complement in hot weather are given, the author finding that the lytic action is usually uniform if the

complement is obtained from the pooled sera of three healthy, non-pregnant guinea pigs which have not been fed for 16 hours. It was found that the removal of guinea pigs to the laboratory the previous night, or the withholding of water during the fasting period markedly reduced the lytic activity of the complement.
—U. F. Richardson.

Mahajan, M. R. (1934). **A Note on Bovine Trypanosomiasis in Hyderabad State.**—*Indian J. vet. Sci.* **4.** 242-246. 1 plate. [3 refs.]

The author records an investigation into an outbreak of bovine trypanosomiasis in a forest area of Hyderabad. The disease was reported to be most prevalent during the season when biting flies are most numerous, and a list of these and also of the ticks encountered in the area is given.

The disease was peculiar in that acute symptoms, resembling those of anthrax, were reported, and in that nearly all the deaths occurred in working bullocks. On investigation it was found that infection might exist for some time before pronounced symptoms developed and that the working of infected animals might account for the acute symptoms. The animals became disinclined to move and foamed at the mouth. There was laboured breathing, excessive urination and death in three to four hours from the onset of symptoms. The administration of " Bayer 205 " at this stage of the disease caused the disappearance of the trypanosomes but did not prevent death. An investigation into the identity of the trypanosome concerned is being carried out.—U. F. Richardson.

Poindexter, H. A. (1934). **A Thermoprecipitation Reaction in Trypanosoma equiperdum Infection in Laboratory Animals.**—*J. exp. Med.* **60.** 575-579. 1 table. [11 refs.]

Experiments are recorded which show that there is a heat-resistant precipitinogenic substance in extracts of the spleens of rats, guinea pigs and rabbits infected with *T. equiperdum*. Extracts of various organs of infected rats, guinea pigs or rabbits were cut into small pieces and triturated in the presence of talc. To this was added five parts of physiological saline for each gram of the original organ. The liquid was then boiled for five minutes at 100°C. and 0·5 c.c. of the extract was layered on an equal quantity of immune serum. It was found that the best reading was obtained after standing for 18 hours in the ice-box. The precipitable substance does not appear to be in the trypanosome itself, as extracts of trypanosomes isolated by the centrifuge failed to give a precipitate. The antibody titre of the serum of rabbits was greater than that of the sera of guinea pigs and rats, and this was shown not only by the reaction with the extracts of rabbits' spleen, but also with extracts of the spleens of the other species. The most pronounced reactions were given with the sera of rabbits which had recovered from the original infection and had been reinoculated to enhance their resistance.

Some cross-precipitation occurred with spleen extracts of rats infected with *T. lewisi* and the serum of rabbits infected with *T. equiperdum*.
—U. F. Richardson.

Ledentu, G. (1934). La lutte contre la maladie du sommeil au Cameroun. [**The Campaign against Sleeping Sickness in the Cameroons**].—*Ann. Inst. Pasteur.* **53.** 174-220. 11 tables, 7 graphs, 1 map.

A standard treatment recommended by the Sleeping Sickness Commission has been used for sleeping sickness cases in the Cameroons since 1932. It consists of injections of " trypoxyl ", " orsanine " or " moranyl ", according to the degree of infection, followed by a course of " tryparsamide ".

On the whole the results have been satisfactory and the more recent centres of the disease have been practically eradicated, yet certain of the old centres of infection have persisted and, in some instances, have actually shown an increase in the number of fresh cases. The author suggests that this failure may be due to special climatic conditions or to the prevalence of glossinae. The failure of treatment to sterilize the blood in certain cases is discussed, and the possible presence of arsenic-resistant strains, but it is pointed out that in these cases the parasites also resist tartar emetic and " moranyl ".

From the cerebrospinal examination of apparently healthy patients five years after treatment, it appeared that 75 per cent. had made a complete recovery, but that in 25 per cent. of cases the cerebrospinal fluid was still abnormal. It is suggested that treated patients should be re-examined and, according to the number still positive, new courses of treatment or the formation of isolation camps should be considered.—U. F. Richardson.

Villela, E., & Dias, E. (1934). Sur la formation d'ulcérations chez les animaux infectés par *Schizotrypanum cruzi*. [**The Formation of Ulcers in Animals Infected with** *Tryp. cruzi*].—*C. R. Soc. Biol. Paris.* **117.** 394-396. [3 refs.]

On experimental infection of dogs with *T. cruzi*, necrotic ulcers are produced in the neighbourhood of the mouth, external genital organs and on the limbs. Sections of the lesions showed an infiltration with endothelial and plasma cells and the presence of parasites which were scanty or numerous. The authors suggest that the tendency of Chagas' disease to cause the formation of ulcers indicates a close relationship between *T. cruzi* and *Leishmania*.—U. F. Richardson.

Hoare, C. A. (1934). **The Transmission of Chagas' Disease. A Critical Review.** —*Trop. Dis. Bull.* **31.** 757-762. [25 refs.]

This review mainly deals with the development cycle of *Trypanosoma cruzi* in the bug *Triatoma megista* and with the evidence as to the method of transmission from the insect host to the vertebrate. Attention is drawn to the recent work of Dias [(1934). *Mem. Inst. Osw. Cruz.* **28.** 1.] which failed to confirm Chagas' account of a sexual process in *Triatoma* or the presence of flagellates in the salivary glands of the bug. On the other hand Dias confirms the work of Brumpt and the view that the method of transmission to the mammalian host is exclusively by the contamination of the mucous membrane or skin with the excreta of infected bugs.—U. F. Richardson.

Bos, A. (1934). Ueber Trichomoniasis bei Tauben. IV. Mitteilung : Pathogenität von Trichomonas columbae für Mäuse. [**Trichomoniasis in Pigeons. IV. Pathogenicity of** *T. columbae* **for the Mouse**].—*Zlb. Bakt. I. (Orig.).* **132.** 453-458. 2 figs. [For absts. of previous articles of this series see this *Bull.* **4.** 29 and 613].

It was considered important to ascertain whether mice were susceptible to the trichomonad of the pigeon in view of the convenience of mice for the maintenance of laboratory strains, and the absence of a natural mouse trichomonad. Mice were inoculated by various methods with pure cultures of *T. columbae* and contracted trichomonad infections which were free from bacteria. Intraperitoneal inoculation proved the most satisfactory method of inoculation and infection was transmitted in series through six mouse passages. Passage through mice of a strain of *T. columbae*, which had lost its pathogenicity for pigeons, did not revive its virulence for these birds, nor was there any evidence of increased virulence for the mouse.—U. F. Richardson.

Holmboe, F. V. (1934). Om utbredelse og behandling av piroplasmose i Norge. [**Bovine Piroplasmosis in Norway**].—*4. Nord. Vet.-mötet. Helsingfors, 1933.* pp. 830-840. 1 fig. [English summary : abst. from orig.]

This disease is found in Norway especially along the south and west coasts from the fjord of Oslo as far as the fjord of Trondhjem. The most northerly point from which it has been reported is Brönnöysund, in Nordland (in the polar circle).

The author discusses curative treatment.—L. Slagsvold (Oslo).

Donatien, A., & Lestoquard, F. (1934). Purification d'une souche de *Theileria dispar* contaminée par *Anaplasma marginale*. [**Purification of a Strain of** *Theileria dispar* **Contaminated by** *Anaplasma marginale*].—*Bull. Soc. Path. exot.* **27.** 650-652. [3 refs.]

The authors found that it was difficult to separate *Th. dispar* from *A. marginale* by blood inoculation as, although the incubation period of the *Theileria* was 17 days, yet 3 c.c. of blood was required for subinoculation to ensure transmission, and anaplasms were already present in the circulation although they could not be detected microscopically until the 28th day.

A pure theileria infection could be obtained by the subinoculation of gland juice behind the shoulder which caused an initial enlargement of the prescapular lymph gland. If 1 c.c. of gland juice was withdrawn from this gland as soon as swelling occurred and inoculated into a new animal, the theileria infection was transmitted without the anaplasma contamination.

Spleen pulp, used as soon as the theileria reaction appeared, and defibrinated blood from which the erythrocytes had been removed by the centrifuge, could also be used to transmit *Th. dispar* and exclude *A. marginale*.

—U. F. Richardson.

Rees, C. W., & Mohler, W. M. (1934). **Preliminary Studies on the Complement-Fixation Test for the Diagnosis of Bovine Anaplasmosis.**—*J. Amer. vet. med. Ass.* **85.** 669-674. 8 tables. [7 refs.]

This article records attempts to obtain a suitable antigen for serological tests to detect cattle which are carriers of anaplasmosis. Definite antigenic value was demonstrated in the washed centrifugate of laked blood drawn from a splenectomized cow during the height of the anaplasmosis reaction, but it was difficult to obtain a sufficient quantity of this antigen, and preparations from other organs of infected animals were not satisfactory. A limited number of tests of the antigenic value of extracts of the viscera of the ticks, *Rhipicephalus sanguineus* and *Boophilus annulatus*, which had fed on infected animals gave very promising results. Although 0·4 c.c., or smaller quantities of the antigen, gave strongly positive results with serum from an infected animal and negative results with normal serum, 1 c.c. of the antigen was not anti-complementary. Extracts of specimens of *R. sanguineus* which had been raised on rabbits to the adult stage gave negative results in tests with the serum of an animal infected with anaplasms.

Extracts of engorged *B. annulatus*, collected from cattle affected with tick fever, appeared to possess antigenic value for both sera of animals infected with anaplasmosis and with piroplasmosis. It was, however, possible that the animals on which the ticks were fed had a latent anaplasm infection in addition to the piroplasm infection.—U. F. Richardson.

Carpano, M. (1934). L'infezione da *Anaplasma* del tipo *marginale* dei bufali in Egitto. [**A Marginal Type of Anaplasma Infection of Buffaloes in Egypt**].—*Clin. vet., Milano.* **57.** 589-592. 1 fig. on 1 plate. [1 ref.]

Carpano records the detection of organisms resembling *A. marginale* in blood smears from a buffalo. He provisionally suggests the name *A. buffeli* for this organism, but points out that circumstances did not allow a full investigation of its biological properties and that it may be identical with *A. marginale* of cattle. The organism was detected in smears from only one buffalo amongst others involved in two outbreaks of a disease which was characterized by fever, anorexia, difficulty in movement and oedema of the feet. The former symptoms disappeared in two or three days whilst the last persisted for two to four weeks. Cattle in contact with the infected buffaloes did not contract the disease.—U. F. Richardson.

Schwetz, J. (1934). Etude morphologique sur les Grahamella, Bartonella et Eperythrozoon des rats et des souris sauvages, splénectomisés et non splénectomisés de Stanleyville (Congo belge). [**Morphological Study of the *Grahamella*, *Bartonella* and *Eperythrozoon* of Wild Rats and Mice, Splenectomized and Non-Splenectomized, at Stanleyville (Belgian Congo)**].—*Ann. Soc. belge. Méd. trop.* **14.** 277-311. 11 plates. [16 refs.]

The author has found in the blood of various species of wild rodents *Bartonella*, *Grahamella* and *Eperythrozoon*, as well as other protozoal forms which he has not attempted to classify.

Bartonella were found in all the classical shapes. In cases of acute infection (i.e. in splenectomized rats) the cocco-bacillary forms predominated. The morphology of the *Grahamella* is not unlike that of the *Bartonella*, but in the case of the former there is usually a greater number of parasites to be found within any single blood corpuscle. *E. coccoides* has been found in a certain number of splenectomized rats associated with bartonella infection.

Organisms which show both protoplasm and chromatin material and which resemble the genera *Theileria* and *Babesia* in morphology have also been encountered. —E. J. Pullinger.

DISEASES CAUSED BY VIRUSES.

Kerr, P. J., & Menon, M. B. (1934). **Preliminary Note on the Use of Goat Tissue Vaccine alone for the Control of Outbreaks of Rinderpest.**—*Indian J. vet. Sci.* **4.** 75-80. 2 tables.

This is a report on original work carried out by the authors in Bengal in the control of rinderpest. They employed the goat (live) virus described by Edwards [(1930). *Imp. Inst. Agric. Res. Pusa. Bull.* No. 199.], made from the spleen of experimentally infected goats ; this they termed " tissue vaccine " to distinguish it from the goat blood virus previously used. The vaccine was used only on cattle of low susceptibility. The authors considered that the extremely satisfactory results obtained justify the conclusion that this method of inoculation may possibly revolutionize the procedure of rinderpest control in India.—C. Davenport.

Saïd, A. (1934). La Peste bovine en Syrie. [**Rinderpest in Syria**].—*Rec. Méd. vét. exot.* **7.** 115-128. [1 ref.]

This article describes the course of the rinderpest epizootic in Syria during the years 1925 to 1927 and the measures adopted for its eradication. The disease was introduced from Turkey in supply cattle imported by the military authorities. It spread throughout the territory mainly owing to the difficulty in securing effective control while military operations were in progress. That the losses in the southern part of the country were considerably smaller than in other areas is

ascribed to a greater resistance of the local cattle. The disease was finally eradicated by quarantine measures, adopted in co-operation with the governments of Palestine and Transjordania, the slaughter of affected animals and the protection of in-contacts with serum. The author considers that, to prevent further epizootics, the veterinary establishment should be increased, and provision be made to manufacture anti-rinderpest serum locally. He considers that the use of serum is preferable to the use of vaccines in this area.—U. F. Richardson.

Galloway, I. A., & Elford, W. J. (1933). **The Differentiation of the Virus of Vesicular Stomatitis from the Virus of Foot-and-Mouth Disease by Filtration.**—*Brit. J. exp. Path.* **14.** 400-408. 3 tables. [15 refs.]

It is shown that the virus of vesicular stomatitis has a particle size of 70 to 100 $m\mu$, being about eight times the estimated size of the virus of foot and mouth disease. In the words of the authors " such a vast difference in the physical properties of the viruses points directly to the distinct individuality of the two diseases, and would be extremely difficult to reconcile with a ' variant ' hypothesis ". Parallel results were obtained with two immunologically distinct strains of the vesicular stomatitis virus, namely the " Indiana " and " New Jersey " strains.

The chief distinguishing features of the two diseases are summarized in the following table taken from the original article :–

Contrast in Characteristics in Vesicular Stomatitis and Foot-and-Mouth Disease.

Contrast.		Vesicular stomatitis.	Foot-and-mouth disease.
Susceptible animals...		Horses susceptible.	Horses very, if not absolutely resistant to infection.
Active immunity ...		Subinfective doses of virus produce a solid immunity.	Subinfective doses of virus do not, as a rule, produce an immunity.
Passive immunity ...		Immune serum will protect against the primary lesion in the guinea-pig.	Immune serum will not protect against the primary lesion in the guinea-pig.
Contact infection	Cattle ...	Contact infection not easy to produce experimentally.	Very contagious.
	Pigs ...	Infection of *young* pigs by contact possible.	,, ,,
	Guinea-pigs	Guinea-pigs may develop an immunity through contact, although developing no visible lesions.	Guinea-pigs do not develop an immunity by contact unless lesions appear.
Generalized lesions ...		Occur infrequently. In the guinea-pig the generalized lesions tend to appear on the uninoculated fore pads	Occur with great regularity. (Some strains are reported to behave irregularly in this respect.)

Contrast.	Vesicular stomatitis.	Foot-and-mouth disease.
	and the tongue is only rarely involved.	Most strains give generalized lesions on the tongue as well as on the uninoculated pads of guinea-pigs.
Appearance of lesions in guinea-pigs ...	Fully developed primary lesions on pads 48/72 hours after inoculation.	Fully developed primary lesions 24 hours after inoculation.
Neurotropism ...	Symptoms referable to lesions in central nervous system follow intracerebral inoculation of virus into guinea-pigs and mice.	No evidence of symptoms or lesions referable to the central nervous system.
Tissue culture ...	Evidence of survival and propagation in tissue cultures of chick embryo pulp.	No evidence of survival of virus in tissue cultures of chick embryo pulp.

—Gwilym O. Davies.

Curasson, G. (1934). La fièvre aphteuse en pathologie exotique. [**Foot and Mouth Disease in Tropical Pathology**].—*Rec. Méd. vét. exot.* **6.** 65-76. [25 refs.]

This article discusses the distribution of foot and mouth disease in the British and French colonies in Africa and Asia and the differences between the disease as it appears in these areas and the classical picture of foot and mouth disease in Europe. With the exception of the Union of South Africa and certain islands, it seems that the disease appears from time to time in all the territories under consideration and in many of them it is definitely enzootic.

In general, throughout these areas, the disease exhibits a mild form, the mortality, in most cases, being confined to calves and young pigs. Outbreaks associated with serious loss of cattle have, however, been recorded from various territories. The disease is sometimes of considerable importance in that it may stir up latent infections of trypanosomiasis, piroplasmosis or pleuro-pneumonia.

No definite information is yet available as to whether the local viruses correspond with those of Europe. In general, the tropical strains appear to be less resistant and the rapidity of contagion is reduced, but these factors may be largely governed by climatic conditions, such as heat and humidity.

The disease has been recorded in cattle, buffaloes, pigs, goats and sheep ; in the last species often no recognizable symptoms are shown. Various species of game appear to be susceptible, but do not seem to have been to any large extent responsible for the spread of disease. Both species of camel are said to be susceptible, though this has been disputed by such authorities as Piot Bey and Leese. The disease appears to be rare in these animals even in regions where they are in contact with cattle. Buffaloes come next to cattle in the degree of their susceptibility, but it is fairly usual for them to exhibit only buccal lesions which may pass unobserved.—U. F. Richardson.

Iwanov, B., & Akulow, A. (1934). Pathologisch-anatomische Veränderungen bei der sogenannten bösartigen Form von Maul- und Klauenseuche bei Meerschweinchen. [**Pathological-Anatomical Changes in So-Called Virulent**

Form of Foot and Mouth Disease of Guinea Pigs].—*Z. InfektKr. Haustiere.* **46.** 5-14. 2 plates. [30 refs.]

Pathological-anatomical changes in guinea pigs include the following. Striated muscle shows alteration including swelling, vacuolation, granule formation and fatty changes ; structural differentiation is lost and the tissue develops into a homogenous mass. In the final stage multiple foci of coagulative necrosis are to be found scattered about the muscles. The psoas and masseter muscles are those most commonly affected. Macroscopically altered muscle tissue is anaemic, pale greyish yellow in colour and very friable. On section it is dry and nodules are apparent. Changes are also found in the bronchi, stomach wall, alimentary tract, adrenal glands, pancreas, lymph glands, salivary glands, brain and peripheral nervous system. In general terms, these changes comprise liquefaction with vacuolation of cell protoplasm leading to coagulative necrosis.

The foregoing work confirms and amplifies that of Bohl and Agulnik [(1930). *Z. InfektKr. Haustiere.* **38.** 121]. These workers, however, described the changes as being primarily of an inflammatory nature, whereas the present authors consider the primary changes to be degenerative.—E. J. Pullinger.

Sarnowiec, W. (1934). Nouvelle méthode de diagnostic des maladies à virus filtrants ; son application au diagnostic de la fièvre aphteuse. [**New Method of Diagnosis of Virus Diseases ; Its Application to the Diagnosis of Foot and Mouth Disease**].—*C. R. Soc. Biol. Paris.* **115.** 934-937. [1 ref.]

The author describes a new method, based on the existence of an allergic state, for diagnosing the presence of virus infections.

Animals infected with foot and mouth disease can be detected by an intradermal injection of antigen consisting of a formolized suspension of vesicle epithelium. The injection gives rise to a local reaction, a temperature reaction and, in guinea pigs, to a general reaction. It is most accentuated in the early stages of the disease, but is appreciable up to three weeks after the onset of symptoms.—Gwilym O. Davies.

Remlinger, P., & Bailly, J. (1934). Vaccination préventive du chat contre la rage. [**Vaccination of the Cat against Rabies**].—*Maroc méd.* Oct. 15th. 418-421. 1 fig. [4 refs.]

In this article Remlinger and Bailly advocate an extension of the preventive vaccination of cats against rabies. The First International Congress on Rabies (1927) expressed the view that in no circumstances should the cat be subjected to either preventive or curative vaccination. While admitting that, in Europe, there is little necessity for the protective inoculation of the cat, the authors point out that in certain parts of Northern Africa there has been a marked increase in feline rabies. This contention is supported by a series of figures from Tangier, Tunis, Egypt, etc. : moreover, it is noted that the number of persons receiving antirabic treatment as a result of bites from cats varies from 5 per cent. to 12 per cent.

The method recommended is the subcutaneous inoculation of an etherized vaccine prepared from infected rabbits or dogs. The vaccine induces no appreciable local or general symptoms.—R. E. Glover.

Hurst, E. W. (1934). **The Histology of Equine Encephalomyelitis.**—*J. exp. Med.* **59.** 529-542. 16 figs. on 4 plates. [15 refs.]

This is essentially a study of an outbreak which occurred in New Jersey and Virginia in 1933, together with a comparison of the " eastern " and " western " types of the disease [this *Bull.* **4.** 616].

The " eastern " type of equine encephalomyelitis was characterized histologically by an unusually intense and diffuse acute inflammation of the central nervous system in which a primary nerve and neuroglial cell degeneration accompanied by leucocytic infiltration was present. Nuclear inclusions occurred as in Borna disease.

Horses experimentally infected with the " western " virus presented lesions which were individually indistinguishable from those of the " eastern " type, but were much less intense and not so extensive. Encephalomyelitis lesions were also evoked with the " eastern " virus in a calf, a sheep and a dog. The guinea pig revealed a histological picture comparable with that in horses, the lesions produced by the " eastern " and " western " strains being indistinguishable. The rabbit was not susceptible and only revealed a temporary illness, especially in the case of the " western " strains.—Gwilym O. Davies.

Larsell, O., Haring, C. M., & Meyer, K. F. (1934). **Histological Changes in the Central Nervous System following Equine Encephalomyelitis.**—*Amer. J. Path.* **10.** 361-374. 7 figs. on 2 plates, 1 table. [26 refs.]

This paper consists of a histological study of the brains and spinal cords of eight horses infected either experimentally or by contagion, two artificially infected guinea pigs and a farm hand who died with symptoms resembling those of equine encephalomyelitis. Tissues from four other horses, three dead of " sepsis " and one undescribed, served as controls.

Perivascular leucocytic infiltration of the blood vessels, together with scattered patches of leucocytic infiltration, chiefly in the grey matter, were the most constant features.

Whereas cytoplasmic inclusions were found to be present in all the animals studied, affected and controls, the number appeared to be considerably greater in the horses dead of encephalomyelitis, but the authors failed to demonstrate intranuclear inclusions and found little indication in the nuclei of anything other than normal chromatin granules.

Many nerve cells exhibited degenerative and necrotic changes.

—Gwilym O. Davies.

Guillot, G., & Guilhon, J. (1934). La cholestérinémie dans l'anémie infectieuse expérimentale du Cheval. [**Cholesterolaemia in Experimental Infectious Anaemia of the Horse**].—*C. R. Soc. Biol. Paris.* **117.** 320-321. [2 refs.]

This paper is a report of further work by the authors in connection with their study of the variations in the amount of cholesterol found in the blood of horses affected with infectious anaemia. Four foals experimentally inoculated showed hypercholesterolaemia in a similar manner to naturally affected cases. The increase appeared at the time of blood cell destruction and was highest at death.

—C. Davenport.

Cominotti, L. (1934). Contributo allo studio della eredo-immunità contro la peste suina. [**Inherited Immunity against Swine Fever**].—*Clin. vet., Milano.* **57.** 95-110. [14 refs.]

The author gives a short summary of the knowledge obtained up to the present time regarding inherited immunity to swine fever, paying particular attention to American work. The divergence of opinion on this subject is largely due to the wide-spread use of hyperimmune serum which masks true cases of inherited immunity. The author, however, has made two observations which suggest that

it does occur. Two pregnant sows were immunized in the ordinary way and kept isolated until after parturition. The young pigs were given 1 c.c. of virulent virus, in one case 77 days, and in the other 96 days, after weaning. Both litters showed themselves to be resistant. They also tolerated 5 c.c. doses of virulent virus some months after weaning, although in one case a marked reaction was produced.

—J. A. Nicholson.

Bendinger, G. (1934). Zur histologischen Diagnostik der Schweinepest. [**Histological Diagnosis of Swine Fever**].—*Tierärztl. Rdsch.* **40.** 499-500.

As a result of the examination of 23 pigs suffering from various forms of "swine fever", the author concludes that changes in the central nervous system are to be found in a very large proportion of cases. In very acute cases of disease, histological changes may be almost entirely absent. Pigs which are suffering from infection may sometimes show no lesions visible macroscopically. Examination by histological methods of the nervous tissue of such animals generally reveals signs of infection.—E. J. Pullinger.

da Costa, A. M. (1933). Quelques essais d'immunization contre la peste porcine. [**Some Attempts to Immunize against Swine Fever**].—*Arch. Inst. bact. Cam. Pest.* **7.** 97-100. [Orig. in French].

The experiments described consisted in inoculating swine with the chemically attenuated virus of swine fever and ascertaining the degree of immunity by introducing into the pen a pig inoculated with virus and a normal pig.

The addition of 1 per cent. of chloroform to defibrinated virulent blood and of 1·5 per cent. to ether-treated suspensions of spleen, liver and lymphatic glands did not render these tissues innocuous, even after an interval of 68 days at room temperature. The addition of 0·4 per cent. of formalin to liver tissue did not induce complete attenuation, but of four pigs inoculated with the suspension three did not show symptoms and the fourth recovered after a mild attack when their immunity was tested three weeks later. The immunizing properties of formalinized virus is further demonstrated by another experiment, but in this, of six pigs vaccinated, two that had received double quantities died before being infected. Swine fever could not be demonstrated in these pigs. The remaining four withstood infection when tested.—R. S. Roberts.

Klobouk, A. (1933). Encephalomyelitis enzootica suum. Cást III. Ultravisibilní, Berkefeldovými filtry procházející virus vyvolavatelem choroby. [**Encephalomyelitis enzootica suum : Ultravisible Virus as Cause of the Disease**].—*Zverolék Rozpravy.* **7.** 133-139, 145-151, 157-167, 169-180, 181-188, 193-201, 205-208, 217-221, 229-234, 246-250, 253-257 and 265-270. 1 table. [8 refs.]

The author carried out experiments to study the nature of the infective agent of encephalomyelitis enzootica suum [this *Bull.* **4.** 466]. The brain and cord of pigs dead from the disease were removed aseptically and mixed with an equal volume of 25 to 50 per cent. glycerin. The emulsion diluted with Ringer solution was passed through a Berkefeld filter. Small doses of the filtrate were inoculated intracerebrally into 16 healthy pigs. After 8 to 29 days all animals showed typical symptoms of encephalomyelitis, clonic-tonical spasms and later paralysis of different degrees. *Post-mortem* examinations of killed animals showed the pathological changes in the brain and cord which are typical for the naturally contracted disease.

Soon after intracerebral inoculation some of the animals developed symptoms of a non-specific nature, slight increase of the body temperature, ataxia and diarrhoea, but these symptoms disappeared in one to seven days. The intensity of non-specific reactions depended upon the quantity of injected brain tissue.

This experimental work indicates that an ultravisible virus capable of passing through a Berkefeld filter is the cause of encephalomyelitis enzootica suum. The virus is present throughout the brain and cord. It is very resistant to 50 per cent. glycerin.

The author was able to pass the infective agent through four pigs.

The relation of encephalomyelitis enzootica suum to other contagious diseases of pigs caused by ultrafiltrable viruses, especially to swine fever, will be the subject of further study by the author.—E. Pribyl (Brno).

Verge, J., & Lance, H. (1934). La grippe des porcelets. [**Swine Influenza**].—*C. R. Acad. Sci. Paris.* **198.** 1276-1278.

A description is given of an outbreak resembling swine influenza in young pigs of two to six weeks of age in which the symptoms and *post-mortem* changes were fairly similar to those described by Shope [this *Bull.* **2.** 84].

Haemophilus influenzae was isolated from three affected animals. The growth characteristics of this organism on various media are noted and mention is made of the difficulty of maintaining cultures in spite of frequent transfers. Up to the present, the authors have not demonstrated the filtrable virus of swine influenza.
—R. E. Glover.

Daubney, R., & Hudson, J. R. (1934). **Nairobi Sheep Disease : Natural and Experimental Transmission by Ticks other than** *Rhipicephalus appendiculatus*.—*Parasitology*. **26.** 496-509. 7 tables, 3 charts. [7 refs.]

The authors have investigated an outbreak of Nairobi sheep disease in an area in which the animals were not infested with *R. appendiculatus*. Severe losses were reported, but the disease tended to spread less rapidly and the lesions were less marked than in districts where the condition is enzootic. The nature of the infection was definitely established by the inoculation of susceptible sheep and, subsequently, by the proof of resistance of animals immune to a laboratory strain of the virus.

Since it was thought that the infective agent might be carried by ticks other than *R. appendiculatus*, various species, both from this district and from areas where the disease is common, were examined for their power of transmitting the virus. *R. simus*, abundantly present in both localities, was first tested. It proved impossible to induce the larvae and nymphae to feed on sheep, but partially fed adult ticks from sheep suffering from the natural disease were successfully engorged on susceptible animals without provoking any reaction. Nymphae bred from larvae which had fed on infected field rats, *Arvicanthus abyssinicus nairobiae*, failed to transmit the virus, whilst nymphae fed in a similar manner became infected but lost the virus during the moult.

Of other ticks tested only one, *Amblyomma variegatum*, was capable of transmitting the virus. With this species the disease was set up by nymphae infected as larvae and by adults infected as nymphae. The passage of the virus from the adult females through the eggs and larvae was not demonstrated. Negative results were recorded with *R. evertsi*, *R. pulchellus*, *R. bursa*, and *Hyalomma aegyptium*.
—R. E. Glover.

KITT. (1934). Altes und Neues über die Pocken und deren Schutzimpfung. [**The Poxes and Immunization against them**].—*Münch. tierärztl. Wschr.* **85.** 221-224 and 233-238. [2 refs.]

Variola and its relationship to the vaccinia virus are discussed, nothing new being, however, described. Evidence has been brought forward in the past suggesting that fowl pox virus is capable of producing a pustular stomatitis in horses and calves. Furthermore, fowls immune to fowl pox are also immune to sheep and cow pox. These and other facts all point towards a very close interrelationship between the various types of pox. The principle underlying vaccination consists of the alteration of virulence of virus by passage or other means. [The consensus of opinion, based on cross-immunity tests, is that neither cow pox nor sheep pox confers any immunity against fowl pox. The claim that calves are susceptible to fowl pox virus is open to serious doubt.—Ed.]

—E. J. PULLINGER.

WILLIAMSON, G. (1934). **Report of an Outbreak of "Variola equina".**—*J. R. Army vet. Cps.* **6.** 12-23. 6 tables.

This article is the record of an outbreak of a contagious disease of cavalry horses in India simulating equine variola. 104 horses and a few mules were affected; the exact source of infection could not be established. In the majority of cases the lesions were confined to the anterior aspect of the lower portion of the limbs. In three cases only were mouth lesions seen. Laceration of the legs in passing thorn bushes was considered to explain the predominance of cases of infection in that region. The incubation period appeared to be about seven days. The lesions were in the nature of a mild vesicular eruption unaccompanied by any constitutional disturbance. Secondary infection proved troublesome until action was taken to prevent it. Control of the outbreak by isolation of affected animals proved a failure, but segregation of the regiment met with a considerable measure of success.

The author carried out a number of inoculation experiments. Infection of healthy horses by scarification and inoculation in the neck or coronet region was effected with ease and the artificially induced disease showed no increased severity. The information so obtained was used in an endeavour to shorten the duration of the outbreak by inoculation of the unaffected animals.—C. DAVENPORT.

VAN HEELSBERGEN, T. (1934). Immuniteit tegen kippenpokken- en diphtherie na enting met "antidiphtherin". [**Vaccination against Fowl Pox with "Antidiphtherin"**].—*Tijdschr. Diergeneesk.* **61.** 764-767.

A description of a fowl pox prophylactic named "antidiphtherin" which is said to be a fowl pox virus modified by passage through another animal, the name of which is not given. It is stated that the virus is not a pigeon pox virus.

—A. KLARENBEEK (UTRECHT).

MATSUMURA, T. (1934). **On the Identity between the Virus of Contagious Epithelioma of Fowls and the Vaccine Virus. I. The Gallinization of the Vaccine Virus through Fowl-Passage. II. The Vaccinization of the Epithelioma Virus through Rabbit-Passage. III. Reversion of the Modified Vira to their Original Ones. IV. Comparison of Pathogenicity among Vaccine, Epithelioma, Gallinized Vaccine, and Vaccinized Epithelioma Viruses. V. Conclusion.**—*J. Jap. Soc. vet. Sci.* **13.** 39-50, 92-104 and 105-117. 7 tables. [34 refs.] [Orig. in Japanese: abst. from English summary].

I. The author describes the results obtained by the serial passage of vaccinia

virus through fowls. The virus strains employed were highly virulent for human beings, calves and rabbits. The inoculations were made on the scarified combs and wattles of fowls. The virulence of the virus for fowls was usually considerably modified after the second passage, and following the third or fourth passage the lesions induced were indistinguishable from those of fowl pox.

Fowls recovered from inoculation with the virus of the first passage were generally immune to subsequent inoculation with vaccinia virus and susceptible to the vaccinia passage virus [number of passages ?]. Fowls recovered from virus of the fourth passage were susceptible to vaccinia virus, and resistant to the vaccinia-passage virus. A local immunity developed on the combs and wattles of fowls recovered from the passage virus, but the skin of the breast remained susceptible to the virus.

Parallel to the changes in the virulence of the passage virus for fowls there was a gradual loss of virulence for calves.

II. The author adapted fowl pox virus (Japanese strain) to rabbits by testicular passage. The virus was adapted after the fourth passage and was then capable of producing a papular eruption on the skin of rabbits.

Rabbits recovered from inoculation of fowl pox virus of the fourth passage were still susceptible to a virulent vaccinia virus, but following the fifth passage the virus immunized against vaccinia virus.

Similar experiments were carried out with fowl pox viruses of American and of Korean origin, but neither was so readily adapted to the rabbit as the Japanese strain.

III., IV. & V. Matsumura, continuing these experiments, successfully re-adapted to rabbits the vaccinia virus previously adapted to fowls. After five passages through rabbits' testicle the reversion was complete. Similarly the fowl pox virus adapted to rabbits was re-adapted to fowls. The reversion was complete after four passages.

Vaccinia virus when adapted to fowls lost the property of forming Guarnieri bodies and recovered this property on reversion to its original state. Fowl pox virus when adapted to rabbits acquired the property of producing Guarnieri bodies and lost this property on reversion to its original state.

Matsumura concludes that variola, vaccinia and fowl pox viruses are merely types of the same virus, as has previously been claimed by Toyoda.

—T. M. Doyle.

Picard, W. K. (1934). Ueber Pseudogeflügelpest und die Variabilität des Pseudogeflügelpestvirus. [**The Variability of the Virus of Pseudo-Fowl Plague —Newcastle Disease**].—*Zlb. Bakt. I.* (*Orig.*). **132.** 440-447. [12 refs.]

The epidemiology, symptomatology and pathological anatomy of pseudo-fowl plague (Newcastle disease), as it occurs in the Dutch East Indies, are described. Transmission experiments by contact were followed, usually, by 100 per cent. infection and this method of infection was as effective as the injection of virus-containing material. The incubation period was slightly longer than that of typical fowl plague. As well as being intensely virulent for fowls, the virus also infected pigeons and ducks readily; turkeys and geese proved less susceptible. Picard discusses the literature concerning the relationship between the viruses of typical and of pseudo-fowl plague, and it is concluded that these viruses are very closely related. Differences between the two infections, such as the greater pathogenicity of pseudo-fowl plague virus and its ability to attack a variety of birds, are probably due to variation of virus from a common parent strain.

—E. J. Pullinger.

JUNGEBLUT, C. W., MEYER, K., & ENGLE, E. T. (1934). **Inactivation of Poliomyelitis Virus and of Diphtheria Toxin by Various Endocrine Principles.**—*J. Immunol.* **27.** 43-56. 6 tables. [13 refs.]

An antiviral factor for poliomyelitis virus appears to be present in anterior pituitary body preparations and in cortical and medullary adrenal preparations of animals and man, but the fresh tissue of these glands did not appear to have any appreciable action. The technique followed was to mix virus and preparation *in vitro*, incubate one and a half hours at room temperature, and keep overnight in the ice-box before inoculating intracerebrally into a monkey. The cortical adrenal preparation also inactivated diphtheria toxin, and sometimes pregnancy urine principles, in crude or chemical fractions, had the same effect.

The relationship of these neutralizing agents to the endocrine secretions is not certain ; they are thermostable and may be identical to the hormones, or may be specific antibodies.—NORMAN HOLE.

INVERTEBRATE VECTORS OF DISEASE.

BODENHEIMER, F. S. (1934). **Ecological Studies on some Ticks.**—*Parasitology.* **26.** 489-495. 3 charts. [4 refs.]

Bodenheimer has investigated the tolerance of the egg and larval stages of three species of ticks to variations in climate.

Ornithodorus coniceps was found to have a low thermal death-point, but high air humidity requirements. *Argas persicus* was found to be very resistant to climatic influences, thus accounting for its wide distribution. *Hyalomma aegyptium* appeared very tolerant towards temperature, but less tolerant towards low humidity than *Argas*.

In Palestine it was found that the development of *O. coniceps* was very slow during winter and that eggs could only develop in the humid spring. The other two species, however, could develop in all stages from spring to autumn, and actually do so.—J. S. STEWARD.

SWYNNERTON, C. F. M. (1934). **Protection of Vegetation against Grass-Fires as a possible Solution for some Tsetse Problems.**—*Bull. ent. Res.* **25.** 415-430. 12 figs. on 4 plates, 3 tables, 1 chart, 1 map. [12 refs.]

This article records the effects of the protection of vegetation on *Glossina swynnertoni* in certain areas of Tanganyika Territory and discusses the probable efficacy of this method of eradication on other species of tsetse fly. In the areas under experiment, the protection of the vegetation against grass fires over a number of years has led to an increase of thicket with, apparently, no effect on the distribution of game. The numbers of *G. swynnertoni* have diminished to one-fifteenth of their original number ; this reduction may be due to failure in breeding or to emigration. The effect is probably produced by additional humidity and a lowered temperature being inimical to the tsetse which, the author considers, will probably disappear with the ultimate climax of vegetation.

The effect of the protection of vegetation against grass fires will vary with the climatic and geological conditions and the type of vegetation present. In some areas, a suitable type of vegetation for thicket production can be introduced. The author considers that the method may be valuable in some *G. morsitans* areas and there is some evidence that it is inimical to *G. pallidipes*. It is probable that thicket formation would lead to an increase of *G. brevipalpis*.

—U. F. RICHARDSON.

Henrard, C. (1934). Quelques essais de capture de Glossina palpalis au moyen de divers types de piège Harris près du Stanley Pool. [**Some Attempts to Trap *Glossina palpalis* with Different Types of Harris Traps near Stanley Pool – Belgian Congo**].—*Ann. Soc. belge Méd. trop.* **14.** 263-276. 2 figs., 6 tables.

Henrard records the results of using several modifications of the Harris trap. The most successful was a trap supplied by the English Consul at Léopoldville, which was smaller and lighter than the other types and could be set up or taken to pieces in as little as seven minutes.

With *G. pallidipes* excellent catches were made, but *G. palpalis* was not so easily caught. It was found that the presence of man, and less so of animals, in the neighbourhood of traps favoured increased catches, and it is considered that Harris traps may be of value for the protection of man and animals when fixed in much frequented places near rivers, such as bathing places, fords, etc.

—J. S. Steward.

Morris, K. R. S. (1934). **The Bionomics and Importance of *Glossina longipalpis*, Wied., in the Gold Coast.**—*Bull. ent. Res.* **25.** 309-335. 11 figs., 4 tables, 2 maps. [15 refs.]

Morris gives a detailed account of the bionomics of *G. longipalpis* Wied. in the Gold Coast, the environmental conditions and the influence of climate being discussed at length. The fly was found to be inactive at temperatures below 74°F. with high humidities of 80 or 90 per cent. or over, and was influenced more by temperature than by humidity, although the movement of the fly into the open was apparently governed by humidity.

The main food hosts of this species were small game animals and when these were dispersed the fly quickly and completely disappeared. Reptiles and birds were apparently not used as a source of blood.

G. longipalpis was found to be infected with *Tryp. gambiense*, *T. congolense* and *T. vivax*, and is considered as probably second in importance to *G. palpalis* as a vector of sleeping sickness in the Gold Coast, but of less importance, at the moment, than *G. palpalis* or *G. tachinoides* in the transmission of animal trypanosomiasis.—J. S. Steward.

Pod'yapol'skaya, V. P., & Gnedina, M. P. (1934). **On the Role of Flies in the Epidemiology of Helminthic Infections.**—*Med. Parasitol., Moscow.* **3.** 179-185. 1 fig. [7 refs.] [Orig. in Russian : French summary]. [Abst. from abst. in *Rev. appl. Ent.* **22.** 196-197].

The adults of *Musca domestica* and *Calliphora erythrocephala* were fed in the laboratory on human faeces and on equine faeces which had been artificially infected with the eggs of *Ascaris lumbricoides*, *Enterobius vermicularis*, *Trichuris trichura* or *Diphyllobothrium latum*. Subsequent microscopic examination of the flies revealed the presence of eggs on the wings and legs of the flies and, although neither the faeces nor the matter regurgitated by *M. domestica* contained any helminth eggs, the faeces of *C. erythrocephala* usually contained a large number, the maximum observed being 53.

Observations under natural conditions also revealed the presence of helminth eggs in the faeces of flies, those of *Dicrocoelium dendriticum* being frequently found in flies in the vicinity of an abattoir and it was calculated that within the space of 12 hours 34 flies deposited, on the average, three helminth eggs.

—E. L. Taylor.

DISEASES CAUSED BY METAZOAN PARASITES.

Myers, J. G. (1934). **Field Observations on some Guiana Insects of Medical and Veterinary Interest.**—*Trop. Agriculture, Trin.* **11.** 279-283. [4 refs.]

Among " eye-flies " recorded as a source of torment to man and presumably also to animals were *Hippelates* sp., *Trigona* sp. (stingless bees) and a small heteropterous bug (*Amnestus*).

Myiasis is recorded as commonly due to *Chrysomyia* [*Cochliomyia*] *americana* and occurred frequently in the pack-bullocks following the bites of vampire bats (*Desmodus* sp.).

The ecological distribution of Tabanidae is given at some length and the restricted feeding hours of certain species are recorded. A brief note is also made of facultative blood-sucking by phytophagous Hemiptera.—J. S. Steward.

Aubertin, C., & Buxton, P. A. (1934). *Cochliomyia* **and Myiasis in Tropical America.**—*Ann. trop. Med. Parasit.* **28.** 245-254. 4 figs. on 1 plate, 1 table. [27 refs.]

Aubertin and Buxton discuss the systematics, biology, geographical distribution and pathology of *Cochliomyia* and the myiasis caused by larvae of that genus. The writers adopt the name *C. hominivorax* for the species described by Cushing and Patton under the name *americana* [this *Bull.* **4.** 576].

Myiasis due to *C. hominivorax* appears to be more common in human beings than in cattle and it is suggested that the myiasis of cattle in America is largely due to this species.

A key is given to the external characters of the species at present known.

—J. S. Steward.

Wernery, H. (1934). Die Parasiten der Rinderlungen im Münsterland. [**Parasites of the Lungs of Cattle around Münster**].—*Z. Fleisch- u. Milchhyg.* **44.** 383-385. [13 refs.]

Half of the cattle slaughtered in the abattoir at Münster are found to be infected with lung parasites and the proportion of lungs showing pathological changes as a result of parasitism is even greater. Some 300 lungs showing lesions due to the presence of parasites were examined. Lungworm infection was very prevalent and, in addition to foci of broncho-pneumonia, was observed to cause worm nodules such as appear in the lungs of affected sheep. In 19 per cent. of the lungs evidence of fluke infestation was found ; the young flukes appeared to have caused small haemorrhages which had become encapsulated, wherein partly developed flukes were found. Echinococcus infection was only found in 6 per cent. of lungs. Larvae of the ox warble were found in 1·3 per cent. of the lungs, these also had become encapsulated ; it is the first time that pathological changes caused by these larvae in the lung have been reported. Pentastome larvae were found in 1 per cent. of the lungs, but did not cause any macroscopic changes.

—E. L. Taylor.

Svítil, J. (1934). Pathologicko-histologický obraz cholangitis et pericholangitis distomatosa. [**Pathology of Fascioliasis**].—*Zverol. Rozpravy.* **8.** 184-192, 193-200 and 205-209. 11 figs. [14 refs.]

The author describes his pathological-histological findings in the examination of livers infected with *Fasciola hepatica*. The relevant literature is reviewed. In all, 60 livers of cattle were examined. In the majority of cases (73·33 per cent.) the bile-ducts of the left lobe only showed lesions ; in 23·33 per cent. the other

lobes were also affected and in 5 per cent. the caudal lobes only were altered. In the early stage of invasion the mucous membrane of the bile-ducts was swollen, their lumina were enlarged and the walls were infiltrated with cellular elements, especially with leucocytes. Later, there was hypertrophy of fibrous tissue accompanied by regressive and dystrophic changes. The wall of the bile-ducts was frequently infiltrated with lime salts. Secondary bacterial infection occurred in the vicinity of the bile-ducts, especially in the ventral part of the left lobe.

—E. Pribyl (Brno).

van den Berghe, L. (1934). Les schistosomiases humaines et animales au Katanga (Congo belge). [**Schistosomiasis in Man and Animals at Katanga (Belgian Congo)**].—*Ann. Soc. belge Méd. trop.* **14.** 313-374. 5 text figs., 15 plates, 1 table. [30 refs.]

A comprehensive account is given of the present knowledge on this subject. Price's classification of the Schistosomidae is followed and the description of several of the species which are mentioned is taken from his 1929 publication on that subject, additions being made from van den Berghe's own observations. *S. mattheei* and *S. margrebowiei* (found in cattle) are, apparently, accepted as valid species. Specimens which the author considers to be referable both to *S. bovis* and *S. mattheei* have been found in cattle at Katanga and photographs of the eggs of *S. margrebowiei* show marked specific characters. The paper also gives a description of the intermediate hosts and a considerable amount of information on the disease as it appears in the native population, its prevention and its treatment.

—E. L. Taylor.

Swaminathan, R. (1934). **A Case of Schistosomic Dysentery in a Dog.**—*Indian vet. J.* **11.** 112-114. [1 fig.]

The author describes the finding of numerous schistosome eggs in the faeces of a dog suffering from recurrent dysentery. These eggs [which according to the figure are of the *Schistosoma mansoni* type] were identified as those of a species called *S. suis*.

The dog is still under observation and a further report is promised later.

—E. L. Taylor.

I. Mönnig, H. O. (1934). **Helminthology. [Bilharziasis].**—*S. Afr. med. J.* **8.** 319-320.

II. Pijper, A. (1934). **The Pathology of South African Bilharziasis.**—*Ibid.* 320-321.

III. Epstein, B. (1934). **The Signs and Symptoms of Bilharziasis.**—*Ibid.* 321-323. [4 refs.]

IV. Wrongsley, W. H. L. (1934). **The Treatment of Bilharziasis.**—*Ibid.* 323.

V. Kieser, J. A. (1934). **Bilharzia and the School.**—*Ibid.* 323-325.

VI. Cluver, E. H. (1934). **Prevention of Urinary Bilharziasis in the Union.**—*Ibid.* 325-326.

[Papers read at a symposium, Northern Transvaal Branch, Med. Ass. South Africa with discussion].

I. In this symposium Mönnig deals with the parasitological aspect of the subject. With reference to the infection of human beings with *Schistosoma bovis* and the validity of the species *S. mattheei* he points out that, as snails infected with one miracidium give rise to cercariae all belonging to the same sex, the biological test can be applied and the most valuable experimental proof so obtained where uncertainty exists as to the identity of two species.

II. Pijper deals with the pathology and touches on the question of immunity.

III. Epstein describes the symptoms in the various stages of the disease as it appears in South Africa.

IV. Wrongsley briefly summarizes the dosage of tartar emetic, " fouadin " and emetine hydrochloride.

V. Kieser deals principally with the mental disability resulting from the disease.

VI. Cluver deals principally with the destruction of snails and cercariae and the protection of water from infection, by storage for more than 48 hours and by the use of copper sulphate at the rate of 1 lb. to every 100,000 gall. of water.

—E. L. Taylor.

Gordon, R. M., Davey, T. H., & Peaston, H. (1934). **The Transmission of Human Bilharziasis in Sierra Leone, with an Account of the Life-Cycle of the Schistosomes concerned,** *S. mansoni* **and** *S. haematobium*.—*Ann. trop. Med. Parasit.* **28.** 323-418. 17 text figs., 13 figs. on 3 plates, 8 tables, 1 graph, 1 map, 1 appendix with 2 figs. [57 refs.]

It has previously been shown that *S. haematobium* is transmitted by *Physopsis globosa* and that *S. mansoni* is transmitted by *Planorbis pfeifferi*, but the snails used in the observations which gave these results were not reared under controlled conditions so that, on account of the high incidence of naturally occurring infection, there is no proof that the cercariae which were described by the authors concerned are those of *S. haematobium* and *S. mansoni* respectively. In the observations here described animals were inoculated with cercariae obtained from the two species of snails above mentioned, white rats, guinea pigs and monkeys being used. With the exception of the rats the experiment led to the development of the adult trematodes. Laboratory bred specimens of *Pl. pfeifferi* and *Ph. globosa* were infected with *S. mansoni* and *S. haematobium* respectively – *Pl. pfeifferi* could not be infected with *S. haematobium* nor *Ph. globosa* with *S. mansoni* – from pure infections in man and in animals and a study made of all the stages of development. A useful technique for the selective staining of cephalic glands is described by which the cercariae of each species were shown to have four anterior and six posterior cephalic glands, but even with the aid of this technique it was not found possible to distinguish between the cercariae of *S. mansoni* and those of *S. haematobium*. A temperature of 32° to 33°C. was found to be optimum for rapid development in the snails, the discharge of cercariae first occurring on the 13th to 15th days, but at all temperatures *S. haematobium* was found to develop more slowly than *S. mansoni*. At 26° to 28°C. *S. mansoni* matured in three to four weeks and *S. haematobium* in five to six weeks.—E. L. Taylor.

Connolly, M. (1934). **On the Planorbid Hosts of Bilharziasis in South and West Africa.**—*Ann. trop. Med. Parasit.* **28.** 439-443. 12 figs.

The differentiation of the species and races of *Physopsis* and *Planorbis* associated with the dissemination of schistosomiasis in South and West Africa is difficult, even for the expert, on account of the many local variations. Those who are concerned with conchology only in so far as the transmission of this disease is involved do not require, however, to enter into very great detail, but can be satisfied with a name and description which is adequate to convey to others the appearance of the shell in question. In order to assist medical workers in this field the author gives a short account of the species of *Planorbis* and *Physopsis* in South and West Africa. Four names appear to be considered adequate for all practical purposes :– *Planorbis pfeifferi*, widely distributed and showing several

variations ; *Pl. stanleyi* from Albert Nyanza and Lake Tanganyika ; *Physopsis africana* for the well-known South African form and *Ph. globosa* for all other members of this genus which act as vectors in Central Africa.—E. L. Taylor.

Orloff, I. W., Erschoff, W. S., & Badanin, N. W. (1934). Eine neue Trematoden-Krankheit der Schafe, hervorgerufen durch *Skrjabinotrema ovis* nov. gen., nov. sp. (Fam. Brachylaemidae Dollfus, 1931). [**A New Trematode Disease of Sheep Caused by *Skrjabinotrema ovis* n.g. n.sp.**].—*Wien. tierärztl. Mschr.* **21.** 321-326. 3 figs.

This new disease has been observed in Chinese sheep in the provinces of Kirgisien and Usbekistan in Asiatic Russia. Affected sheep do not exhibit any particularly characteristic symptoms, but only the general ones of undernourishment, debility and usually diarrhoea. Diagnosis is not easy unless a *post-mortem* examination is carried out when a catarrhal condition of the mucous membrane of the posterior portion of the small intestine is seen to be present in association with a massive infestation of minute flukes, adhering to the surface of the membrane.

The trematode, which is found to be new to science, is related to the genus *Hasstilesia*, but differs in that the genital opening is laterally situated and the testes are not placed in tandem, and are confined to the posterior third of the body. The fluke measures only 0·79 to 1·12 mm. long by 0·32 to 0·70 mm. broad and is placed in the new genus *Skrjabinotrema*.

The eggs are very small, 0·024 to 0·032 mm. by 0·16 to 0·02 mm., operculated at one pole and bearing a small knob at the other. They are of a dark brown colour and contain a miracidium.—E. L. Taylor.

I. Krause, C. (1934). Ueber den Alveolarechinokokkus der Lunge bei Rindern und Büffeln. [**Alveolar Echinococcus in the Ox and the Buffalo**].—*Berl. tierärztl. Wschr.* **50.** 207-209. 4 figs. [15 refs.]

II. Hemmann. (1934). Hochgradige Echinokokkeninvasion (Echinococcus alveolaris) beim Rinde. [**Extreme Echinococcus Invasion in a Bovine**]. *Z. Fleisch- u. Milchhyg.* **44.** 382-383.

I. Of 733 cattle killed at the Sofia abattoir, 90 per cent. were infected with echinococcus and 75 per cent. of 221 buffaloes were also infected. Only one case of alveolar echinococcosis was seen in the buffaloes (in the liver), but 49 cases were seen in cattle, of which 22 were found in the lung. Five of these were primary and the remainder were associated with alveolar echinococcosis of the liver. Some description is given of the naked-eye appearance of the " tumours ". The frequency of the occurrence of alveolar echinococcosis in Bulgaria, as compared with its rarity in other parts and the difference in its distribution among cattle and buffaloes in Bulgaria, appears to point to the causal parasite being specifically different from *E. granulosus* (during 12 months only 30 cases were observed in 200,000 cattle in Berlin).

II. Hemmann gives an account of an extraordinarily heavy infestation of echinococcus cysts in a cow, the condition of which was first diagnosed as tuberculosis. *Post-mortem* examination showed echinococcus cysts in almost every organ, including most of the lymph glands, and the liver weighed 50 lb.—E. L. Taylor.

Wetzel, R. (1934). Untersuchungen über den Entwicklungskreis des Taubenbandwurmes Aporina delafondi (Railliet, 1892). [**Life-Cycle of the Pigeon Cestode *Aporina delafondi* (Railliet, 1892)**]. *–Dtsch. tierärztl. Wschr.* **42.** 500-502. 1 fig. [English summary : abst. from orig.]

Aporina delafondi belongs to the family Anoplocephalidae as do also the tapeworms of the horse and of sheep and cattle. The life-cycle of all the members of this family still remains unknown in spite of many attempts which have been made to throw some light upon it. One theory is that, contrary to the case with almost all other cestodes, no intermediate host is required and in order to test this view the author fed ripe segments of this worm to young experimental pigeons. The results were, however, negative, as also were the results from attempted infection through the meal-worm (the larva of the beetle, *Tenebrio molitor*), the house-fly and several species of slugs and snails. As the pigeon would only swallow possible intermediate hosts by accident it is unlikely that transference of infection depends upon this eventuality and the author thinks it probable that, after developing to a certain stage in some intermediate host, the parasite enters upon a free cystic stage in which it is taken up by the final host.—E. L. Taylor.

I. Krueger. (1934). Finnen beim Rinde und Bandwurmbefall beim Menschen. [**Cysticercus in Cattle and Tapeworms in Man**].—*Z. Fleisch- u. Milchhyg.* **44.** 401-403.

II. von Ostertag, R. (1934). Bemerkungen zu vorstehender Abhandlung. [**Comment on the Above, (Krueger's Paper on Cysticercus)**].—*Ibid.* 403-404.

I. & II. Infection with *C. bovis* in cattle and *Taenia saginata* in man is of unusually frequent occurrence on the water meadows at Cottbus in North Germany, about 1 per cent. of men and 3 per cent. of cattle being infested. The question assumed such importance that Krueger wrote to Sprehn and Wetzel (two well-known parasitologists) and to von Ostertag to ask their advice on steps to be taken for eradication, and the opinion of these experts is given at length, von Ostertag's appearing as a separate contribution. All agree that the infestation is water-borne, and that disinfection of this water is quite out of the question. Grazing should be stopped and all the herbage be made into hay, the hay-making process, von Ostertag points out, resulting in the destruction of the onchospheres within 12 days. Prohibition of the sale of offal is suggested by Wetzel and all consider the anthelmintic treatment of infested persons to be a most important step towards control, together with the education of the people of the district through schools and the press.—E. L. Taylor.

I. Stiven, H. E. S. (1934). **Ascaris in the Appendix.**—*Lancet.* **226.** 51. 1 fig.

II. Lièvre, H. (1934). A propos de l'hématophagie des *Ascaris*. [**Haematophagy of** *Ascaris*].—*C. R. Soc. Biol. Paris.* **116.** 1079.

I. Stiven describes an operation for appendicitis in which an adult ascaris was found to be present in the appendix. He attributes the prevalence of ascaris infection in Port Said to the breeding of large numbers of pigs at the town destructor. [The way in which this is connected with human ascariasis is not described].

II. Lièvre made a spectroscopic examination of the contents of the intestine of *A. lumbricoides* from man and from pig, *A. megalocephala* and *Toxocara canis*. No trace of haemoglobin was found in the species of *Ascaris* and in *T. canis* only traces were found in 75 per cent. of those examined ; the amount present was no more than might have resulted from raw meat in the dog's food and it was concluded that these worms are not blood suckers.—E. L. Taylor.

Kristensen, M. H. (1934). Noen bemerkninger om Syngamus trachea. [**Notes on** *Syngamus trachea*].—*Norsk VetTidsskr.* **46.** 193-196. [7 refs.]

In contradiction to Grini [(1933). *Norsk VetTidsskr.* **45.** 505 and 566.] the

author quotes authorities to show that the female of *S. trachea* can still lay eggs while attached to the male.

He mentions that American as well as German work seems to have shown that the turkey is the most important source of infection and that in the turkey, contrary to the behaviour in fowls, the parasite may appear in full-grown birds, their health, however, remaining unaffected.—L. Slagsvold (Oslo).

Wetzel, R. (1934). Zur Ernährung und pathogenen Wirkung der Oesophagostomen. [**The Nutrition and Pathogenic Action of Oesophagostomes**].—*Dtsch. tierärztl. Wschr.* **42.** 602-603. 1 fig. [10 refs.]

After reviewing the findings of other authors with allied helminths and his own work, Wetzel comes to the following conclusions :– (1) the oesophagostomes of sheep and swine do not appear to fasten themselves very firmly by their mouth capsules to the mucous membrane ; (2) they produce a chronic inflammation of this membrane ; (3) the secretion of the head glands appears to be the chief means of production of the inflammation, and (4) the inflammatory products of the mucous membrane serve as food for the oesophagostomes.—A. W. N. Pillers.

I. Foster, A. O., & Landsberg, J. W. (1934). **The Nature and Cause of Hookworm Anemia.**—*Amer. J. Hyg.* **20.** 259-290. 6 tables, 6 graphs. [27 refs.]

II. Rhoads, C. P., Castle, W. B., Payne, G. C., & Lawson, H. A. (1934). **Hookworm Anemia : Etiology and Treatment with Especial Reference to Iron.**—*Ibid.* 291-306. 5 figs., 1 table. [39 refs.]

I. The more recent theories on hookworm anaemia have explained its occurrence by (a) the production of substances which injure the blood-forming organs ; (b) the excessive loss of blood, or (c) a combination of these two.

The authors have carried out a series of observations on dogs experimentally infected with *Ancylostoma caninum*, making a careful study of the blood picture in the resulting anaemia and comparing it with the anaemia produced by periodic withdrawal of blood. [This procedure is similar to the one adopted by Fourie whose work appears to have been overlooked in studying the anaemia of haemonchosis – this *Bull.* **2.** 158].

They conclude that it is unnecessary to postulate a toxin to account for the anaemia which appears to be identical with the anaemia clinically associated with chronic haemorrhage. It was found to respond readily to iron therapy, as also did the anaemia produced by periodic experimental bleeding, and the authors find themselves in full agreement with the hypothesis that the anaemia of hookworm disease is of a purely haemorrhagic nature.

II. Observations were carried out on 83 human patients infected with hookworms and showing typical hookworm anaemia, and the relative efficiency of treatment of the anaemia by the removal of the parasite, by improvement of the diet and by the administration of iron or of liver extracts was determined. It was found that the only marked improvement resulted from the administration of iron ; the removal of the worms in the absence of other therapy had very little effect upon the anaemia which the authors consider to be caused by a combination of blood loss, dietary deficiency and defective nutrition.—E. L. Taylor.

Low, G. C., Manson-Bahr, P. H., & Walters, A. H. (1934). **Further Observations on Filarial Periodicity.**—*Lancet.* **227.** 531-535. 2 figs. [9 refs.]

Counts were made at two-hourly intervals of the numbers of microfilariae in the blood of an Indian lascar infected with *Filaria bancrofti*. These observations

were carried out throughout one period of four days of ordinary life and an eight-day period of " reverse life " in which the patient rested and slept in a darkened room during the whole of the day and fed and moved about actively in an illuminated room during the night. Towards the end of the eight-day period of reverse life the periodicity curve became a little broken, but the most interesting observation was that the total number of embryos remained about the same regardless of the host's routine. This observation gives further support to the authors' contention that the embryos are produced in a more or less steady stream by the parent worm, and probably retire to the blood vessels of the lungs during the periods at which they are only found in small numbers in the peripheral circulation.

—E. L. Taylor.

Popesco, F. (1933). Des foyers de filariose canine en Roumanie. [**Canine Filariasis in Rumania**].—*Arhiva vet.* **25.** 145-148. [In French].

From 1925 to 1933 inclusive, Popesco found 32 dogs out of 31,000 examined at Bucarest affected with filariasis. Later he discovered numerous cases in 20 communes situated in seven districts and concludes that Rumania must be included among the countries having a large proportion of dogs infected with filariasis. [The name of the helminth is not given, but apparently the work refers to the microfilariae of the heart-worm, *Dirofilaria immitis*].—A. W. N. Pillers.

Ballo, A. G. (1933). Adatok a lovak vérének mikrofilariosisához hazánkban. [**Microfilariasis of Horses in Hungary**].—*Inaug. Diss. Budapest.* pp. 10. [Abst. from German summary].

150 horses at studs in the Hungarian plain were examined for the presence of microfilariae. Several c.c. of blood were taken from a jugular vein, diluted four-fold with 0·1 per cent. citrate solution, sharply shaken after haemolysis and the parasites looked for in the sediment.

For microscopic examination Pappenheim's preparations [paraffin sections stained by the Giemsa method] or sections in gelatin containing methylene blue, were used.

Nineteen horses had microfilariae, the incidence being higher in horses living on damp ground. Younger horses were more frequently infested than older ones. Of yearlings examined 37 per cent. were infested ; of two-year-olds, 14·7 per cent. and of three-year-olds only 2·7 per cent. The microfilariae measured 277 × 6·9μ. The degree of infestation per c.c. of blood varied between 16 and 371.

These worms caused no loss of health. With regard to classification, Ballo states that the microfilariae observed by him bore a resemblance to larvae of *Setaria papillosa*. The only abnormality in the blood picture of infested horses was a slight eosinophilia.—J. E.

Spindler, L. A. (1934). **Skin Penetration Experiments with the Infective Larvae of** *Stephanurus dentatus*.—*N. Amer. Vet.* **15.** No. 10. 32-36. 1 table. [7 refs.]

Skin penetration experiments with larvae of *S. dentatus* have, in the past, given seemingly contradictory findings. Spindler's work here recorded was initiated to explain these differences. His results, in conjunction with those of Schwartz and Price, Bernard and Bauche, and Ross and Kauzal, show that the larvae are only able to penetrate the skin when some substance is present on it, against which the larvae can brace themselves. In nature it is soil and other debris adhering to the skin which fulfil this role.—A. W. N. Pillers.

Wolffhügel, K. (1934). Paraplegia cruralis parasitaria felis durch Gurltia paralysans nov. gen. nov. sp. (Nematoda). [**Crural Paralysis in Cats caused by *Gurltia paralysans* n.g. n.sp. (Nematode)**].—*Z. InfektKr. Haustiere.* **46.** 28-47. 7 figs., 1 table. [14 refs.]

A disease of cats, of frequent occurrence in South Chile and the Argentine, characterized by a slowly advancing posterior paresis and leading finally to a complete motor paraplegia, is found to be due to infestation with a metastrongylid parasite in the veins of the lumbar portion of the cervical cord, where its presence results in thrombus formation. The parasite, for which the author erects a new genus and names *Gurltia paralysans*, is closely allied to *Haemostrongylus*, but the male possesses a gubernaculum, dorsal rays are absent from the bursa, and lips and papillae are also absent. The eggs are passed into the vein in an early stage of segmentation and apparently do not develop beyond the 16 cell stage while in the thrombus. The original host appears to be the wild cat, *Felis guigna*. The possibility of blood-sucking insects acting as intermediate hosts was investigated, but nothing was discovered which might help to elucidate the life history.

—E. L. Taylor.

Blair, J. B., & Lang, O. W. (1934). **Effect of Low Temperature Freezing on the Encysted Larvae of Trichinella spiralis.**—*J. infect. Dis.* **55.** 95-104. 5 tables. [5 refs.]

Previous experiments on the lethal effect of the new " quick freezing processes " upon encysted trichinae have been carried out on guinea pig muscle infected with recently encysted larvae. The authors find, however, that the trichinae in rat muscle are more resistant, and their results indicate that an increase in the age of the larvae increases their resistance. Their experiments on pork were inconclusive because insufficient larvae were present, and they consider that additional investigations on heavily infected pork are imperative.—E. L. Taylor.

IMMUNITY.

Hill, A. B. (1934). **The Inheritance of Resistance to Bacterial Infection in Animal Species.**—*Spec. Rep. Ser. med. Res. Coun., Lond.* No. 196. pp. 71. 2 figs., 26 tables. [67 refs.] [8vo] [1s. 3d.]

—. (1934). **Resistance to Infective Disease.**—*Brit. med. J.* Oct. 6th. 643-644. [1 ref.]

—. (1934). **Inheritance of Resistance to Infection.**—*Lancet.* **227.** 762-763. [1 ref.]

The production, along eugenic lines, of individuals resistant to disease, whilst of limited application in human beings, might have far-reaching possibilities in animals if it could be definitely shown that such a project had any reasonable chance of success. In this monograph the author reviews critically the published literature on this subject and draws attention to the many pitfalls which beset an investigator. Insufficient attention to these pitfalls in the past has caused many erroneous conclusions to be drawn and consequently has given rise to a very confusing mass of literature. In the course of this report the author sifts out the " proven " from the " non-proven " and also indicates the lines along which the efforts of future investigators should be directed.

The second and third references are to editorials on this publication.

—Gwilym O. Davies.

Sarnowiec, W. (1934). Contribution à l'étude des réactions allergiques croisées dans la tuberculose et la brucellose. [**Study of the Crossed Allergic Reactions in Tuberculosis and Contagious Abortion**].—*Ann. Inst. Pasteur.* **53.** 166-173. [10 refs.]

A study of the action of an abortin, consisting of a bacterial suspension, on tuberculous animals and that of tuberculin on animals infected with *Brucella abortus*.

Tuberculous guinea pigs reacted to the abortin in a certain number of cases, the degree of reaction increasing with the age of infection. Guinea pigs vaccinated with BCG failed to react to the abortin. In human tuberculous patients, the abortin gave rise to a reaction analogous to that of tuberculin, but it appeared and disappeared earlier than was the case with tuberculin.

Guinea pigs experimentally infected with *Br. abortus* gave no response to tuberculin, but cattle with natural infection gave feeble reactions to tuberculin and well-marked reactions to the abortin.

The reactions to non-specific antigens were less characteristic and less regular than those produced by specific antigens.—Gwilym O. Davies.

Lornie, W. S. (1934). **The Tuberculin Test. Some Field Experiences in the Testing of Pure-Bred Cattle for Export.**—*Vet. Rec.* **14.** 1222-1226.

The author describes his routine procedure in the tuberculin testing of pure-bred cattle, particularly those destined for exportation. As tuberculin can be purchased by any layman it is necessary to adopt special precautions for the detection of animals that may have been " doped ". He formerly employed a combination of the ophthalmic and subcutaneous tests. In the subcutaneous test an initial injection of 20 c.c. of tuberculin is given and a similar dose at the ninth hour. The temperature is taken every hour, starting at the seventh. Charts showing results obtained with the subcutaneous test are included. Lornie believes that if an animal is given repeated doses of tuberculin, it will develop some degree of desensitization, and will give a delayed reaction to a subsequent test.

When any dispute arises regarding a test, a combination of tests, consisting of the subcutaneous, ophthalmic, intradermal and subpalpebral, is applied.

The author now prefers the double intradermal test to the subcutaneous as it eliminates the labour of taking temperatures. When the intradermal test is applied to animals for export they must show a clean pass ; doubtful reactors are not given a second chance. Animals showing pain at the site of injection – irrespective of the measurements – are also rejected.—T. M. Doyle.

Spiegel-Adolf, M., & Seibert, F. B. (1934). **Spectral Analysis of Purified Tuberculin.**—*J. biol. Chem.* **106.** 373-385. 3 figs., 4 tables. [23 refs.]

Ultraspectrographic analysis of the purified tuberculin products of protein nature shows in many instances a characteristic absorption with a maximum at 265 and 267 $m\mu$ which seems to be due to thymus nucleic acid. There seems to be some kind of an association between the potent principle and this substance, but the two are distinct.—W. R. Wooldridge.

Jones, F. S., & Orcutt, Marion. (1934). **The Prozone Phenomenon in Specific Bacterial Agglutination.**—*J. Immunol.* **27.** 215-233. 1 fig., 8 tables. [15 refs.]

Certain specific sera fail to agglutinate bacterial suspensions at the lower dilutions although they readily flocculate similar antigens in greater dilutions. Various theories in explanation of this phenomenon are discussed and the authors have studied two such sera specific for *Br. abortus*. In both cases agglutination

was inhibited in low dilutions. Bacteria not agglutinated in the prozone could be centrifuged and, if resuspended in the same mixture, they remained in suspension. If, however, such bacteria were resuspended in saline, agglutination usually occurred promptly. An additional washing was sometimes necessary when a considerable amount of prozone serum was present. Other experiments indicated that the electric charge of bacteria was similar in both the inhibitory zone and agglutination zone. There was in addition in both cases the usual increase in the volume of the sensitized bacterial cell. There were, however, differences between the rate of sedimentation in bacterial cells sensitized in the inhibitory zone and those sensitized in the agglutination zone.

Taking these results into consideration, it is concluded that the failure to agglutinate is due to the deposition, on the surface of the deposited globulin film, of a substance which interferes with the cohesive properties of specifically sensitized organisms. There is no evidence that this substance prevents impacts between bacterial cells, as washing is known to remove it and to expose the globulin, and new impacts lead to agglutination. Inhibitory sera, therefore, appear to possess this additional substance which is present in low dilutions, preventing the cohesion of sensitized bacterial cells.—R. Lovell.

Heidelberger, M., & Kabat, E. A. (1934). **Chemical Studies on Bacterial Agglutination. I. A Method.**—*J. exp. Med.* **60.** 643-653. 3 tables. [18 refs.]

The authors review the unsatisfactory nature of quantitative analysis as applied to immunity reactions, due largely to the lack of knowledge of the nature of the materials between which immune reactions take place. Assuming that immune reactions are chemical reactions, and that antibody is actually protein, a method is described for the estimation of the agglutinin content of antisera. It is based on the quantitative micro-determination of precipitins, as the agglutination of bacteria may best be interpreted as a precipitin reaction at the surface of the cells. The method can be reversed and used for the quantitative micro-determination of an antigen or hapten.

Using pneumococci and corresponding antisera the method consists of adding measured quantities of sera to measured quantities of bacterial suspensions. After agglutination has occurred the amount of nitrogen is determined in the centrifuged suspensions and in saline controls. Three figures are thus obtained, namely, the total nitrogen, the bacterial nitrogen and the difference, this last being the nitrogen of the agglutinin precipitated on to the surface of the cells. It affords an exact analytical determination of the amount of agglutinin present in absolute terms.—R. Lovell.

Paarmann, E. (1934). Eine verbesserte Technik des Nachweises von Tuberkulosereaginen in der Milch durch die Komplementbindung. [**An Improved Technique for Demonstrating Tuberculosis Antibodies in Milk by Complement-Fixation**].—*Berl. tierärztl. Wschr.* **50.** 568-570. 4 tables. [17 refs.]

From observations of 185 samples of milk, most of which were negative, Paarmann claims that, in carrying out complement-fixation tests for tuberculosis, skim milk is preferable to whey. Using this and the antigen of Witebsky, Klingenstein and Kuhn, non-specific fixation is uncommon.—A. W. Stableforth.

Viridén, P. (1933). Finnes det något lagbundet förhallande mellan den profylaktiska serumdosen och infectionsdosen, då det gäller rödsjukebaciller infekterade på mus? [**Connection between the Prophylactic Dose of Serum**

and the Infective Dose when Infecting Mice with *Erysipelothrix rhusiopathiae* (Swine Erysipelas)].—*Skand. VetTidskr.* **23.** 421-432. 4 tables. [English summary : abst. from orig.]

The results of a long series of experiments in infecting mice with cultures of the swine erysipelas bacillus after, or simultaneously with, a dose of serum show that the dose of serum required for protection against the infective dose does not depend to any great extent upon the size of the infective dose. Only in cases where the prophylactic dose is very small and near the minimal limit and the infective dose is very large can any connection be shown between them. This is shown in the tables of doses given.—A. A. Forsyth.

Phéloukis, T. (1934). Le rôle de la moelle osseuse dans la genèse des anticorps malléiniques. [**Role of the Bone-Marrow in the Genesis of Antibodies to Mallein**].—*C. R. Soc. Biol. Paris.* **117.** 316-317. [7 refs.]

Non-glandered horses were injected with mallein and during the following few days blood examinations were carried out. Coincidental with the formation of antibodies to mallein, a leucocytosis and an increase in young neutrophiles appeared indicating increased activity of the bone-marrow. Normality was established a few days after the appearance of antibodies.—R. Lovell.

Cannon, P. R., & Burt, K. L. (1934). **The Mechanism of Antibody Formation After Extirpation of the Antigen-Depot.**—*J. Immunol.* **27.** 173-176. 1 table. [5 refs.]

Investigators have questioned the assumption that antigen must reach the tissues usually considered as the main sources of antibody, in order that antibody may be produced. Their doubts are due to experiments in which antigen was injected into the skin of the ear of rabbits, the ear being amputated after varying periods. The abundant formation of antibody suggested to such observers that the dissemination of antigen throughout the tissues was not necessary for antibody formation. Accordingly the authors inoculated rabbits intradermally in the ear with living suspensions of *Staphylococcus aureus* and *Chromobact. prodigiosum* and at intervals of three seconds to ten minutes after injection the ear was amputated at the base. Approximately ten minutes later cultures from cardiac blood and portions of liver and spleen were prepared. Living bacteria were present in the liver or spleen in 11 of 13 rabbits tested and in the two giving negative results only three seconds elapsed between injection and amputation of the ear. Apparently, therefore, living bacteria and, it is assumed, any antigen may reach the liver and spleen within a few seconds of injection. It, therefore, does not seem necessary to postulate a new mechanism for the formation of antibody until proof is available that antibody formation may occur independently of the escape of antigen from the original injection site.—R. Lovell.

Schwentker, F. F., & Rivers, T. M. (1934). **The Antibody Response of Rabbits to Injections of Emulsions and Extracts of Homologous Brain.**—*J. exp. Med.* **60.** 559-574. 7 tables, 2 charts. [13 refs.]

The authors showed that the injection of rabbits with fresh suspensions of homologous brain produced few or no antibodies capable of fixing complement in the presence of watery suspensions or alcoholic extracts of rabbit brain. Complement-fixing antibodies were produced in rabbits by injections of (1) suspensions of rabbit brain which had been held at room temperature for five to 30 days, and (2) suspensions of rabbit brain infected with vaccinia virus.

Antisera produced by injections of suspensions of autolyzed brain were

shown by absorption tests to contain both specific and non-specific antibodies. The specific brain antigen was about six times more abundant in the white matter than in the grey.—T. M. Doyle.

Goebel, W. F., Avery, O. T., & Babers, F. H. (1934). **Chemo-Immunological Studies on Conjugated Carbohydrate-Proteins. IX. The Specificity of Antigens Prepared by Combining the p-Amino-Phenol Glycosides of Disaccharides with Protein.**—*J. exp. Med.* **60.** 599-617. 8 tables. [6 refs.]

Complex carbohydrates possessing immunologically specific properties have been found widely distributed in different micro-organisms and are known to function as determinant substances in many of the specific reactions of bacterial infection and immunity. That these carbohydrates so closely related in chemical properties remain sharply differentiated in biological specificity may eventually be explained as due to subtle differences in their molecular structure. Disaccharides of known chemical constitution, namely, the p-amino-phenol glycosides of lactose, gentiobiose, cellobiose and maltose were synthesized, their derivatives combined with protein and the resulting conjoined disaccharide-proteins used as antigens in the preparation of immune sera. The immunological properties of these antigens have been studied by precipitin reactions and it has been shown that it is possible to differentiate selectively between the disaccharides studied. Their immunological specificity irrespective of the nature of the conjoined protein is determined by (1) the disaccharide molecule as a whole ; (2) the configuration of the terminal hexose molecule, and (3) the position of linkage of the two hexose units in the carbohydrate radicle. The specificity of the antibodies induced appears to be more sharply defined when the configuration of the terminal hexose is of the β rather than the α type.—R. Lovell.

Todd, E. W. (1934). **A Comparative Serological Study of Streptolysins Derived from Human and from Animal Infections, with Notes on Pneumococcal Haemolysin, Tetanolysin and Staphylococcus Toxin.**—*J. Path. Bact.* **39.** 299-321. 11 tables. [16 refs.]

Haemolytic streptococci from human infections produce an antigenic streptolysin which is serologically group-specific but not type-specific ; in addition to this antigenic form of streptolysin, which is subject to reversible oxidation and reduction, they also produce another variety of streptolysin which is not subject to reversible oxidation and reduction and which appears to have no antigenic activity. The streptolysins of haemolytic streptococci from animal infections do not appear to be antigens and they are not subject to reversible oxidation and reduction. Soluble streptolysin prepared from " pseudo-haemolytic " streptococci appears to be non-antigenic. Lancefield's groups of haemolytic streptococci each produce different varieties of streptolysin which may be distinguished from each other by their reactions to oxygen, to heat and to acid.

Sera with a high titre of antistreptolysin from hyperimmunized horses neutralize tetanolysin and pneumococcal haemolysin to a limited extent ; the degree of neutralization is not necessarily correlated with the antistreptolysin titre and the different haemolysins are distinguishable by quantitative serological methods. This partial antigenic overlapping of haemolysins can only be demonstrated by the use of hyperimmune sera ; it is not seen when the comparatively low titred antistreptolysin sera of patients infected with haemolytic streptococci are examined, and it therefore does not interfere with the use of antistreptolysin titres for the diagnosis of streptococcal infections. The haemolysin of staphylococci is not serologically related to streptolysin.—A. W. Stableforth.

GRUBB, C. M. (1934). **Fatal Anaphylaxis in Horse Caused by Sterile Milk.**—*Vet. Med.* **29.** 461.

The author records the death of a horse in peculiar circumstances. This horse received three injections, of 15 c.c. each, of commercially prepared sterile milk in the treatment of periodic ophthalmia, the injections being made into the pectoral muscles. Immediately following the third dose the horse developed symptoms typical of anaphylactic shock and died. The interval between doses was six to seven days. Two other horses similarly treated showed no reaction. —C. DAVENPORT.

DISEASES, GENERAL.

GRATZL, E. (1934). Die Pathogenese der Blinddarmverstopfungen des Pferdes. [**Pathogenesis of Caecal Obstruction in the Horse**].—*Wien. tierärztl. Mschr.* **21.** 481-494. 5 figs. [10 refs.]

This is a lengthy, detailed and illustrated account of the anatomy, physiology and patho-physiology of the equine caecum. It therefore deals with the head, body, apex, ileo-caecal orifice, caeco-colic sphincter, vestibulum coli and such minutiae as the different sacculi. To be fully appreciated the article should be read in the original. Caecal impaction appears to be quite common in the author's experience. He concludes that in this condition the walls of the caecum are not atonic but are almost always hypertonic. Obstructions are due to active contraction of the wall of the viscus and not to an atonic condition. Atonic states when encountered are not a relation of cause and effect. In such cases the development would be from the apex to base, the opposite is, however, the case because the faecal masses dam up the caeco-colic orifice.

Spasms of the head either completely close the orifice or narrow it with the result that the organ empties itself abnormally and only liquid contents escape, so that in the end faeces collect at the head and later fill the distal portions. In the production of impaction the head rolls on its small curvature, and its blind end presses on the vestibulum coli and blocks it. From the filling of the head the wall stretches and both edges of the caeco-colic orifice come together and close up the exit.—A. W. N. PILLERS.

PETERSEN, G. (1934). Om den formodede Optraeden af den saakaldte Brüsseler-syge i Danmark. [**Infectious Broncho-Pneumonia of the Horse in Denmark**]. *Maanedsskr. Dyrlaeg.* **46.** 15-20. [2 refs.]

A wide-spread outbreak of infectious bronchitis and broncho-pneumonia in horses is described. In the fatal cases, death occurred about 10 to 14 days after the onset of the symptoms. Treatment was symptomatic ; stock sera of various kinds were used with apparently good results.

All types and breeds of horses were attacked, the stronger horses in many instances showing the more acute symptoms. Those suffering from mild attacks were fit for work again in eight to ten days.—A. A. FORSYTH.

BAKER, D. D. (1934). **Infectious Pneumonia of Swine.**—*N. Amer. Vet.* **15.** No. 9. 30-32.

A clinical description of the pneumonia which is associated with swine influenza and swine plague.—J. E.

Schlegel, M. (1934) Die Stallrotkrankheit des Rindes (Haematuria chronica bovis). [**Chronic Bovine Haematuria**].—*Münch. tierärztl. Wschr.* **85.** 365-371, 380-384, 389-393, 404-408 and 416-421. 7 figs. on 2 plates. [57 refs.]

A review of the literature, a description of chronic haematuria of cattle in the Black Forest, Germany, and the results of a detailed investigation carried out by the author in order to elucidate the cause of the disease.

In Baden the disease occurs on granite and sandstone land and in some seasons affects a large number of cattle. Attempts to transmit the disease to healthy cattle and to guinea pigs failed, blood, urine and bladder tumour tissue being given perorally, subcutaneously and intravenously.

The drinking water from an affected area showed, on analysis, a deficiency in minerals and an excess of acids (nitric, silicic and carbonic). Such water (containing 0·17 to 0·3 per cent. of silicic acid) was therefore given experimentally to healthy cattle, but in no case did haematuria develop within about 100 days. Similarly oxalic acid failed to cause the disease.

The flora of affected regions was examined and detailed information on the indigenous plants is given. It was found that the natural order Ranunculaceae was densely represented and it was thought that the haematuria may be due to plants of this order, which contain ranunkulol, an etherial oil which forms needle-shaped crystals. Other poisonous plants, e.g., horsetail, are also present.

The blood of several affected cattle was found to be poor in calcium and phosphorus, to coagulate slowly and to have a low haemoglobin content and there was a low erythrocyte count.

The symptoms and pathological changes of the disease as seen in Baden are described : they conform to those reported from other parts of the world. Schlegel observed a haemorrhagic nephritis and believes that the disease is a haematogenous intoxication originating from plants ingested.

Affected animals usually recover on being taken to good pasture and calcium therapy is said to assist in recovery.—J. E.

Magens, H. J. (1934). **Diphtheroid Angina of Cattle.**—*Vet. Med.* **29.** 274-275.

A clinical description of a febrile, presumably contagious, disease of cattle in Texas characterized by a mild rhinitis which extends into the lungs. The final stage is a croupous inflammation of the entire respiratory tract. The disease is said to resemble one described by Grunth in Denmark [(1905). *Z. Tiermed.* **9.** 232].—J. E.

Nielsen, O. (1934). Om Septikaemier, med saerligt Henblik paa Kalveseptikaemierne. [**Septicaemias, with Special Reference to Calf Septicaemias**]. —*Medlemsbl. danske Dyrlaegeforen.* **17.** 233-239.

The introduction to this article deals with septicaemias generally, their definition, and the symptoms and *post-mortem* findings in animals that have died from this type of disease. The largest section concerns diarrhoea in calves. The author finds it convenient to distinguish between two principal forms of the disease, according to the occurrence of the causal organism in the body, as follows :- (1) those in which the lesions are localized to the intestinal tract alone are not infectious, or are caused by a mixed infection (" *B. isocoli*," *Bact aerogenes*, *Proteus vulgaris* and *Pseudomonas pyocyanea*) and (2) septicaemia which is mostly caused by *Bact. coli*, but may also be caused by other bacteria. A description follows of the occurrence and *post-mortem* findings of septicaemia caused by *Bact. coli*, *Bact. paracoli* [*Salmonella enteritidis*], a bacterium of the paratyphoid group and a certain diplococcus.

The author also describes the disease in calves called " septic pleuro-pneumonia " which is caused by bacteria of the pasteurella group and pyaemia in new-born calves, which is a polybacterial umbilical infection. Since the causal organisms in some of these cases are pathogenic to human beings, he is of the opinion that, apart from other reasons, the carcasses must always be condemned for human consumption.—Gustav Naerland (Farsund).

Heidkamp, K. (1934). Ueber Ursachen und Erkennung der bei Hühnern an den Kopforganen seuchenartig vorkommenden Erkrankungen. [**Aetiology and Recognition of Infectious Diseases of the Head of the Fowl**].—*Berl. tierärztl. Wschr.* **50.** 625-629. [55 refs.]

The conditions of fowl pox (including fowl diphtheria), coryza contagiosa, A-avitaminosis and infectious laryngo-tracheitis are discussed and the differential diagnosis is described.

A characteristic feature of fowl diphtheria is the fibrinous inflammation of the mucosa, which results in pseudomembrane formation. There is sloughing of the mucous membrane, but the submucosa becomes inflamed only to a very slight extent. Coryza contagiosa commences as a serous inflammation of the mucous membranes of the head followed by suppuration ; marked swelling of the orbital fossa is frequently seen and keratomalacia may be present, leading to confusion with avitaminosis. The condition is distinguishable from laryngo-tracheitis by absence of changes in the bronchi. Disorder due to lack of vitamin A is not likely to be confused with other conditions. White nodules are to be found on the mucosa, whilst the occurrence of ataxia and cramp and the lesions of keratomalacia and inflammation of the bronchi and kidneys serve as a guide to diagnosis. Infectious laryngo-tracheitis is accompanied by a serous or slimy haemorrhagic exudate ; mucous membranes are swollen, grey and congested, pseudomembranes are not formed and the submucosa is heavily infiltrated as a result of the inflammatory reaction.

Fowl pox (including fowl diphtheria) is caused by a specific variola virus, infectious laryngo-tracheitis is a virus infection, and the cause of coryza contagiosa is not known.—E. J. Pullinger.

Milks, H. J. (1934). **Eczema.** [**Dogs**].—*Cornell Vet.* **24.** 99-107. [11 refs.]

The author is of the opinion that eczema of the dog is a more serious complaint than mange, due to the more difficult prognosis and the liability to recurrence. The causes are discussed and references to recent literature given. Milks states that certain foods may probably give rise to the condition, but points out the danger of generalizing, inasmuch as the fault is with the individual animal, not the diet, the affected dog exhibiting a hypersensitiveness to some particular food.

The seasonal incidence is noted and the clearing up of the condition, after various methods of treatment, pointed out. The author thinks that too much attention is sometimes paid to changes of diet and too little to a thorough examination for parasitic diseases.—J. E. Wilson.

Antoine, Liégeois, & Verstraete. (1934). Contribution à l'étude des tumeurs chez le chien. [**Neoplasms of the Dog**].—*Ann. Méd. vét.* **79.** 354-371. 2 tables, 7 graphs.

This paper consists in the main of a series of graphs and tables illustrating the incidence of neoplasms in the dog with particular relation to the age, sex and breed of the animal and the localization and nature of the tumours. A great deal

of information, which does not permit of abstraction, is to be found in the tables, but the following are amongst the outstanding points revealed in the investigation.

Tumours are much more common in the female than in the male owing to their frequency in the genital apparatus, especially the mammary gland. All ages are subject to neoplasms, but the predisposition is more marked from the age of seven to a maximum at ten years. The breed seems to have little or no special influence. Of 214 animals, 151 revealed lesions in the female genital apparatus, 126 of which were in the mammary gland ; in 63 cases the tumours involved skin and in 27 other cases they were present in the digestive tract. The precise nature and localization of these tumours are given.

The authors conclude with a few observations on the value of caustics, chemotherapy and ray-therapy, but finally state that, as far as dogs are concerned, there is only one form of treatment, surgical.—Gwilym O. Davies.

Liess, J. (1934). Zur Genese und Behandlung der Papillomatose des Rindes. [**The Genesis and Treatment of Papillomatosis in Cattle**].—*Dtsch. tierärztl. Wschr.* **42.** 521-526. 4 figs. [11 refs.]

Papillomata developed on the skin of cattle following the intradermal injection of papilloma emulsion. Tumours produced in this way developed rapidly, reaching a large size within three months, after which there was a tendency for the growths to disappear. Attempts to reinfect animals which had previously been inoculated with papilloma extract failed to provoke further lesions, though the second injection was followed by an allergic reaction. As regards treatment, apart from awaiting spontaneous healing, or applying surgical measures, some workers report success with extracts of papilloma, but certain proprietary skin tissue extracts (" perlacar " and " antidermatin ") were of no value. To be of value any form of treatment must materially shorten the time taken for spontaneous healing to occur.

—E. J. Pullinger.

Krage, P. (1934). Beitrag zur Aetiologie der Schnüffelkrankheit (Osteodystrophia deformans) der Schweine. [**Cause of Rhinitis (Osteodystrophia deformans) of Pigs**].—*Tierärztl. Rdsch.* **40.** 317-319. 1 table. [1 ref.]

Krage reviews the various theories on the aetiology of snuffles (osteodystrophia deformans) of swine. After a series of breeding experiments, which are tabulated, he comes to the following conclusions. The disease is not due to mineral or vitamin deficiency, nor to an infective agent. The results of Trautmann, that it is due to a hyperplasia and a resultant hyperfunction of the parathyroid glands, are suggestive. The transmission of the disease through the sow or boar has an important bearing ; the author considers that further work must be undertaken to ascertain whether the disease is hereditary or due to other causes. The best method of control is the avoidance of breeding from affected animals. [Osteodystrophia deformans is now regarded as being due to an incorrect ratio of phosphorus to calcium in the diet].—A. W. N. Pillers.

Slagsvold, L. (1934). Stedbundne husdyrsykdomme fremkalt ved stoffmangler eller abnorm forsammensetning. [**Metabolic Diseases of Domestic Animals**]. —*4. Nord. Vet.-mötet. Helsingfors. 1933.* pp. 189-223. 1 table. [English summary : abst. from orig.]

Due to the large variations in soil and climatic and farming conditions, many different metabolic diseases among domestic animals, especially among ruminants, are found in Norway. These diseases can be traced to deficiency in the fodder.

Diseases such as osteomalacia and rickets, due to lack of lime and especially due to lack of phosphates, are common in some parts of the country. Chronic dyspepsia, with acetonuria and emaciation, is especially common in swampy wooded districts, where the pasture and the grass is poor in important mineral substances (phosphates) as well as in albumin and carbohydrates.

Pica is severe in some sandy districts along the coast-line, and is best prevented and treated by supplying alkaline salts, carbonates, etc.

Puerperal haemoglobinuria is confined to certain localities and appears especially after dry summers and on farms where animals are compelled to eat local products.

Some forms of muscle degeneration in calves and lambs are also confined to certain districts. The disease can be prevented by supplying to the pregnant dams the minerals and vitamins necessary.

In certain inland districts goitre is severe in new-born animals, especially in ruminants. A supply of iodine to the pregnant dam acts as a preventative.

—L. Slagsvold (Oslo).

McGowan, J. P., & Emslie, A. R. G. (1934). **Rickets in Chickens, with Special Reference to its Nature and Pathogenesis.**—*Bio-chem. J.* **28.** 1503-1512. 12 figs. on 1 plate. [30 refs.]

Six groups each consisting of 15 three-day-old White Leghorns were used. One group received a basic diet of yellow maize, dried skim milk, yeast and salt. The other groups received in addition varying amounts of $CaCO_3$ and cod liver oil, either alone or in combination. The chickens on the basal diet were all dead by the end of the third week. The remaining groups were weighed at the end of six weeks. Those which had received $CaCO_3$ plus cod liver oil were heaviest, and their bones were normal. Next came those which had a large quantity of $CaCO_3$ only added ; these developed rickets. Least in weight were the chickens which received a small amount of $CaCO_3$ and those which received cod liver oil alone. Both these groups showed osteoporosis.. It is held that Ca is lacking in the food usually given to chickens, and that the naturally occurring osteoporotic condition of the chicken at hatching exaggerates this deficiency. Ca and P are best utilized where they are administered not in chemical combination. The addition of vitamin D, by working along different lines, prevents osteoporosis and rickets. The mechanism of its action is discussed.—Henry Dryerre.

Orr, J. B., & Richards, Marion B. (1934). **Growth and Vitamin A Deficiency.** —*Bio-chem. J.* **28.** 1259-1273. 6 figs., 6 tables. [17 refs.]

Hitherto the rate of growth in experimental animals has been measured by observing the increase in weight. The authors show that this method is fallacious. Skeletal growth was recorded by measuring the tail and the total body length during life, and by measuring the lengths of the femur, tibia and humerus *post mortem*. Black and white Lister rats were used throughout, and 60 controls on a complete diet gave a very high correlation between the increases in body weight and length of bone. On a vitamin A deficient diet the rate of increase in body weight was less than that of the increase in length of bone, the discrepancy manifesting itself as early as the 14th day. The actual weights of the rats fed on a vitamin A deficient diet were in every case less than that calculated for the lengths of their bones. It is concluded that deficiency of vitamin A causes the onset of pathological changes and that, whilst growth does not cease, it is retarded. Evidence is given to show that this slower rate of growth is due to a diminished food intake.

—Henry Dryerre.

Slagsvold, L. (1934). Elektrisk strøms innvirkning på dyr. [**Effect of Electric Current on Animals**].—*Norsk VetTidsskr.* **46.** 265-282 and 331-340. 1 fig. [27 refs.]

A brief review of the questions involved in electric narcosis with a discussion of the effects of electric currents on human beings and animals. Reference is made to lightning stroke.—L. Slagsvold (Oslo).

Dam, H., & Schönheyder, F. (1934). **A Deficiency Disease in Chicks Resembling Scurvy.**—*Bio-chem. J.* **28.** 1355-1359. 6 figs. on 1 plate. [7 refs.]

Chicks raised on a diet of caseinogen, yeast, sucrose (or soluble starch), salts and cod liver oil showed haemorrhages in the subcutaneous tissues, the muscles and the mucous membrane of the gizzard. When the sucrose was replaced by cereals, the symptoms did not appear. Deficiency of vitamins A, B and D were ruled out. The administration of ascorbic acid orally or subcutaneously did not prevent the haemorrhage. It is concluded that the symptoms are due to the absence of a factor (not vitamin C) which is contained in the cereals.

—Henry Dryerre.

PUBLIC HEALTH.

Bryan, C. S. (1934). **Streptococcic Contamination of Dairy Barns.**—*Vet. Med.* **29.** 384-387. [5 refs.] [German summary].

A cultural examination was made of the milk from two herds consisting of 20 and 12 cows respectively, and of the dust and bedding in the cow-sheds, the streptococci being named according to Holman's classification [(1916). *J. med. Res.* **34.** 377].

In the first herd, *Str. agalactiae*, *Str. mitis*, *Str. anginosus* and *Str. salivarius* were obtained from the milk samples and the same organisms with the addition of *Str. fecalis* from the dust. In the second herd *Str. non-haemolyticus* II, *Str. mitis* and *Str. agalactiae* were found in the cows, and *Str. non-haemolyticus* II, *Str. mitis* and *Str. fecalis* in the cow-shed. Both of these examinations were made during the winter.

An examination of the dust and bedding of the second herd during the succeeding summer showed that after the cows went out to grass, being then only in the shed for milking, the streptococcus contamination decreased until after 20 to 30 days streptococci could no longer be isolated.

Dust, litter and bedding collected from the cow-shed and stored at room temperature showed a similar fall in streptococci, but in part of the same material held at 8°C. they survived over one year.—A. W. Stableforth.

Ehrlich. (1934). Die tierärztliche Milchüberwachung in Wirtschaftsgebiet Niedersachsen mit besonderer Berücksichtigung der losen, rohen Frischmilch. [**Milk Control in Lower Saxony**].—*Tierärztl. Rdsch.* **40.** 757-762.

The control of the milk supply by veterinary authorities falls under four main headings as follows :– (1) the supervision of the health of cows. This is effected by monthly examinations of the mixed milk of all cows, in groups of ten, for pathogenic bacteria. Quarterly clinical examinations are carried out for tuberculosis and udder disease. Points to which the examiner must pay particular attention are outlined. Examination of the milk includes an estimation of its content of blood, fibrinogen substance, sodium chloride and catalase ; its reaction is also ascertained. Fore-milk is examined separately. The taste of milk is noted. A

bacterial examination is carried out for mastitis organisms and, if calf paratyphoid is present in the herd, for members of the salmonella group. Samples are also examined for tubercle bacilli and *Br. abortus* ; (2) precautions to be applied as a result of the foregoing examination ; (3) examination of stabling, building and apparatus, and (4) methods of reporting the results of examinations. Headings (2), (3) and (4) are chiefly of local importance.—E. J. Pullinger.

Aaser, C. S. (1934). Melkelkontrollen i Norge. [**Milk Control in Norway**].—*4. Nord. Vet.-motet. Helsingfors, 1933.* pp. 135-144. [English summary : abst. from orig.]

1. Municipal Control.—The department of health in each community may pass instructions concerning milk control. These " standing rules " become law after approval by the Common Council and State Department of Health. Such standing rules are established in 17 towns. Control is carried out by veterinary surgeons. They have the control of the dairies and the premises for sale of milk and also the control of the transport at the place of production.

2. State Control.—By a resolution of the Storting, 1895, three milk control stations were established (Oslo, Bergen and Trondhjem) to which the dairies and the milk-collecting stations send samples, especially for control of quality.

3. Private Control.—This is practised in different ways. The dairies have the sheds and the livestock of the purveyors examined by local veterinary surgeons and also by shed-inspectors, who work together with the local controllers. A number of the big dairy-unions insist on tuberculin tests of the livestock. The milk-purveyors around the larger towns have founded co-operative societies and have appointed veterinary surgeons who by constant supervision and inspection watch the condition of the livestock, as well as the sanitation of the cow-sheds. The personnel of the cow-sheds are subjected to physical examinations.

—L. Slagsvold (Oslo).

Poisson, J., & Thieulin, G. (1934). Viandes pigmentées. Viandes ictériques et viandes à graisse jaune. [**Pigmented Meat. Jaundiced Meat and Meat with Yellow Fat**].—*Rec. Méd. vét.* **110.** 331-344. [2 refs.]

In this report the authors point out that the examination refers to butchers' meat of cattle, horses and pigs. They emphasize the need for the examination of the entire carcass with offal.

Fat is the one tissue in the body which adsorbs and retains all the pigments with the greatest facility.

" Yellow " meat, not jaundiced, owes its colour to broken-down units in the fat which contains the vegetable pigments, carotinoides or lipochromes ; the former is closely allied to vitamin A.

In jaundiced animals general discoloration of the fat is accompanied by different lesions which may indicate the origin of the jaundice. In acute jaundice there is infiltration of the conjunctiva, yellow pigmentation of the mucous surfaces, congestion of the bowels, the colour of the liver is that of a dead leaf and the muscular tissues are fevered (with a sour odour, a salmon-coloured tint and blood-stained serum exudate). Jaundice due to piroplasmosis is marked by effusions under the pericardium and degeneration of the myocardium, with hypertrophy of the liver and lesions in the bowels.

By chemical examination it can be shown that in certain animals deeply pigmented yellow fat is not jaundiced, but that in other animals relatively little pigmented fat contains biliary pigments. If jaundice has been present the surface of the fat is dull, but in cases when the animal has not suffered from jaundice it

is bright. In jaundiced animals the kidney fat in contact with the renal capsule is yellowish-green. This is not seen in a non-jaundiced condition.

The endothelium of the femoral or humeral artery shows yellow coloration in jaundiced animals, while in others the endothelium of these arteries remains white.

Clinical examination is not sufficient to solve the problem of pigmented meat. A chemical examination should be made for biliary pigments. The two most suitable methods are that of Gmelin and that of Ehrlich, the latter being the simpler.

The synovia found in joint capsules or tendon sheaths is useful for chemical examination, particularly in cattle ; in other animals the fat is the most useful tissue for examination.

Jaundiced meat should be condemned : yellow meat other than jaundiced meat should also be seized on account of the abnormal pigmentation.

—Brennan De Vine.

THERAPEUTICS.

Kemal, S. (1934). Die Piroplasmosis des Pferdes. Heilversuche mit Sublimat. [**Equine Piroplasmosis. Treatment with Mercuric Chloride**].—*Wien. tierärztl. Mschr.* **21.** 696-700. 6 graphs. [3 refs.]

The author records the treatment of six cases of equine piroplasmosis which occurred in Turkey in July and August when the disease is severe and often fatal. The animals exhibited a raised temperature, jaundice and petechiae, and in all cases *Babesia caballi* was demonstrated in the blood. One animal, treated by intravenous injections of trypan blue, died. The remaining five recovered under the treatment given, a striking improvement occurring in each case on the day following the administration of an intravenous injection of mercuric chloride. In the majority of cases a dose of 80 c.c. of a 1 per thousand solution was given ; this was repeated about three days later if a second dose appeared to be required.

—U. F. Richardson.

Steevenson, G. F. (1934). **The Treatment of Gastric Habronemiasis in Equines.**—*J. R. Army vet. Cps.* **6.** 29-30. [2 refs.]

This article records recent progress made by the author in the treatment of equine habronemiasis. It is recommended that, for the preliminary washing of the stomach, alkaline solution should be employed in greater strength than formerly and that it should be warmed before use. The modified treatment is as follows :– starvation for 36 hours ; stomach lavage twice, with 2 to 2·5 gall. of sodium bicarbonate solution heated to 105°F. in a strength of 1 oz. to 1 gall. of water. The anthelmintic is then administered, namely 15 to 20 c.c. of carbon bisulphide *per* stomach tube.—C. Davenport.

Wells, A. Y., & Sherwood, N. P. (1934). **Selective Action of Dyes and of other Disinfectants on Bacteriophages.**—*J. infect. Dis.* **55.** 195-198. 2 tables. [3 refs.]

This is an extension of previous work in which further bacteriophages have been used, namely those for *Bact. dysenteriae* (Shiga), *Bact. typhosum* [*Salmonella typhi*], *Bacillus megatherium*, *Staphylococcus*, *Corynebact. diphtheriae* and *Bact. coli*. In addition to crystal violet and brilliant green, gentian violet was tried and also phenol and sodium hydroxide. The details of the experiments do not permit of abstraction, but one of the conclusions drawn by the authors is to the effect that there appears to be a correlation between the selective action of the dyes on bacteria

and that on their respective phages. Furthermore, the phages which lyse Gram-negative bacteria are more resistant to deleterious substances than those which lyse Gram-positive bacteria.—Gwilym O. Davies.

POISONS AND POISONING.

Svensson, S., & Hedström, H. (1934). Kloratförgiftning hos nötkreatur. [**Chlorate Poisoning in Cattle**].—*Svensk. VetTidskr.* **24.** 329-351. 3 figs., 6 tables. [14 refs.] [English summary : abst. from orig.]

The berberis bush is often eradicated by spraying with a solution of sodium chlorate, and cases have been reported of chlorate poisoning in full-grown cattle that have been grazing on sprayed pastures.

The lethal dose of sodium chlorate for full-grown cattle is about 400 g., and acute poisoning results in anoxaemia due to the formation of methaemoglobin, the blood of affected animals becoming characteristically dark. Sodium chlorate is quickly absorbed and is mainly excreted unchanged with the urine.

Diagnosis of chlorate poisoning is made by appropriate urine tests.

—L. Slagsvold (Oslo).

Long, H. C. (1934). **Poisonous Plants on the Farm.**—*Bull. Minist. Agric., Lond.* No. 75. pp. 58. 51 figs. on 22 plates. [11 refs.]

This is a re-issue of the author's small volume first published in 1927, and constitutes a very useful and simply written guide to agriculturists. The figures of 51 poisonous species are especially valuable to the practical man in assisting him to detect plants and weeds undesirable of cultivation on his land.

Our knowledge of vegetable poisons has greatly extended during recent years, more particularly as regards South African, Australian and American species. Happily fatalities in this country are comparatively rare, but emphasis should be laid on yew, which is probably our most dangerous plant ; ragwort, regarding which our knowledge has been greatly extended in recent years ; acorn, which has caused considerable damage in the last two seasons; and ranunculus, which is probably responsible for more damage than is commonly supposed. On the other hand, poisoning by ergot and fungi and by such weeds as darnel is very rare in England. This excellent bulletin should be in the hands of every farmer.

—G. D. Lander.

Holmboe, F. V. (1934). En forgiftning med Landøia. Senecio Jakobaea. [**Ragwort Poisoning in Cattle**].—*Norsk VetTidsskr.* **46.** 302-305.

The author refers to earlier papers in the Norwegian literature and mentions a very serious outbreak.—L. Slagsvold (Oslo).

PHYSIOLOGY.

Doladilhe, M. (1934). Recherches sur certaines Propriétés physiques des Sérums sanguins. [**Physical Properties of Blood Serum**].—*Ann. Inst. Pasteur.* **53.** 379-403. 6 figs., 6 tables. [10 refs.]

The addition of blood serum to a hydrosol colloid does not give rise to flocculation until a certain concentration has been reached ; on further addition, the flocculation clears up. There is at first a sensitization of the colloidal particles and, finally, protection. When the colloid is a gum, resin, or organ-extract, the

final effect of the proteins of the serum is to disperse the colloidal particles. The addition of sodium chloride to the serum-colloid mixture diminishes flocculation and augments dispersion. Warming the serum before addition acts similarly. The serum albumins and globulins were separated and their individual effects upon the colloid system were observed. It was found that the addition of either of these in increasing quantity to a hydrosol colloid gave rise, as with the serum, to flocculation, preceded and followed by a stage of non-flocculation. The globulins, however, had to be employed in greater concentration than the albumins before the flocculation disappeared, which was attained only with difficulty. The dispersing property of the albumins is, therefore, greater than that of the globulins and consequently in the whole serum the flocculating properties of the globulins are partially neutralized. It is concluded that the dispersing power of a serum is a measure of its complement content.—Henry Dryerre.

Doulkin, A., & Helman, S. (1934). Quelques données sur la teneur du sang des vaches laitières en cholestérol et en phosphatides. [**Cholesterol and Phosphorus Content of the Blood of Milch Cows**].—*Le Lait.* **14.** 797-808. 8 tables. [15 refs.]

The cholesterol content of the serum is greater in winter and in stall-fed animals than in the summer or in these animals on open pasture. Feeding with seaweed (*Laminaria saccharata*) lowers the cholesterol content. There is an inverse ratio between the blood cholesterol and the milk yield, the correlation being very high. A high positive correlation is exhibited between the blood lecithin and the milk fat.—Henry Dryerre.

Casey, A. E., Rosahn, P. D., Hu, C. K., & Pearce, Louise. (1934). **Hereditary Variations in the Blood Cytology of Normal Rabbits.**—*Amer. J. Path.* **10.** 677-678. [34th Ann. Meet. Amer. Ass. Path. & Bact. March 29th and 30th].

Examinations have shown that the blood cells of normal rabbits vary widely and that these variations correspond to differences in size and other constitutional factors of the animals. The different blood cell pictures are fairly stable during health and are related to the resistance of the animals to disease. Evidence of inheritance was found in the values for basophiles, lymphocytes, red blood corpuscles and haemoglobin content.—J. A. Nicholson.

Havel, L. (1934). O vlivu adrenalinu normálního a okysličeného na hladinu cukru v krvi psa. [**The Influence of Normal and Oxidized Adrenaline on the Blood Sugar-Level of the Dog**].—*Zverolék. Obz.* **8.** 200-204 and 209-214. 1 table. [12 refs.] [German summary : abst. from orig.]

Solutions of normal and oxidized adrenaline were given intravenously and subcutaneously. The sugar-content of the blood increased very rapidly after the intravenous injection of normal adrenaline and fell again to normal 15 minutes later. The increase of sugar-level after the subcutaneous injection of normal adrenaline lasted for two hours. Oxidized adrenaline injected either intravenously or subcutaneously had no effect upon the blood sugar-level. In suckling puppies the effect of normal adrenaline was very much greater than in full-grown animals.
—E. Pribyl (Brno).

Scowen, E. F., & Spence, A. W. (1934). **Effect of Prolonged Administration of Acid Extract of Anterior Pituitary on the Thyroid Gland of Guinea-Pigs.**—*Brit. med. J.* Nov. 3rd. 805-807. 2 text figs., 8 figs. on 1 plate, 1 table. [18 refs.]

The prolonged administration of acid extract of anterior pituitary to guinea pigs produces thyroid hyperplasia, exophthalmos and suprarenal enlargement. In the majority of the experimental animals the thyroid glands involuted to the colloid state during treatment, but some remained hyperplastic. It could not be shown, however, that the involution was due to thyroid exhaustion. It appears that there is a balance between thyrotropic and antithyrotropic principles which the body maintains in equilibrium.—J. A. NICHOLSON.

—. (1934). **Dosage of Vitamin D.**—*Brit. med. J.* Nov. 17th. 907. [1 ref.]

A group of 529 infants was observed at the baby clinics in Toronto. Controlled observations were made on the efficacy of varying amounts of cod liver oil, viosterol and irradiated pasteurized milk in the prevention of rickets. Cod liver oil was the least efficient ; the other two substances were reasonably effective and equally so. Doses equivalent to 100 units of vitamin D were as effective as larger doses. It is contended that irradiated pasteurized milk presents the most practical way of ensuring a regular daily dosage of vitamin D.—HENRY DRYERRE.

LAMB, L. W., WINTER, O. B., DUNCAN, C. W., ROBINSON, C. S., & HUFFMAN, C. F. (1934). **A Study of the Phosphorus Requirement of Dairy Cattle. II. Phosphorus, Calcium and Nitrogen Metabolism of Dairy Cattle when Alfalfa Furnishes the Principal Source of Protein.**—*J. Dairy Sci.* **17.** 233-241. 5 tables. [5 refs.]

A basal ration of yellow maize silage and phosphorus-low alfalfa was compared with the same ration plus bone meal in two groups of seven heifers before and after calving. Balances are recorded for Ca, P and N. Apparently 10·8 – 12·2 g. P per day was sufficient for growth and pregnancy but insufficient for lactation. With the bone meal supplement, bringing the total P to 39·8 – 62·2 g., balances were positive throughout. On the P-low ration the amounts of Ca and protein utilized were limited by the P intake.—H. H. GREEN.

VORONOFF, S. (1934). Betrachtungen über die histologische und physiologische Entwicklung der Drüsentransplantate. **[The Development of Gland Grafts].** —*Berl. tierärztl. Wschr.* **50.** 610-613. 7 figs.

A number of cases in which tissue has been successfully transplanted are recorded. In one case, testicular tissue from an immature ram was transplanted into an old ram. Fourteen months after the operation the transplant was found to have developed and showed signs of spermatogenesis. Examinations of testicular tissue from monkeys transplanted into other animals have shown that up to six years after operation glandular epithelial cells are present in large numbers, the transplant is rich in blood vessels and there is a firm connection between it and the tissue of the host. The peripheral part of the transplant which has a good blood supply remains active for a longer time than the central portion, where fatty degeneration of the seminal tubules may be seen. Several cases are quoted to show the physiological effect of a transplant. In one case, a 17-year-old bull, which had been impotent and in very bad condition, recovered its health and sexual powers three months after it had received testicular tissue from a young bull. In Russia it is claimed that the operation in sheep produces an increase not only in body weight but also in the weight of the wool.

The author concludes that any aged animal can be rejuvenated but, for the most pronounced effects to be seen, the operation should be carried out on breeds of animals which have not been highly developed. This explains the success that

has followed the method in Algeria, Sudan and Russia, whereas striking effects have not been obtained in the Transvaal or Australia.—J. A. Nicholson.

Küst, & Vogt. (1934). Nachweis der Sexualhormone bei der Ziege und ihre Auswertungsmöglichkeit für die hormonale Trächtigkeitsfeststellung. [**Demonstration of the Sexual Hormone in Goats and its Practical Value**]. —*Tierärztl. Rdsch.* **40.** 589-591. 1 graph. [13 refs.]

The authors obtained blood and urine from nine pregnant and two non-pregnant goats. Oestrin could only be demonstrated in the urine of animals well advanced in pregnancy and it appears that it is excreted in increasing amounts from the seventh week until parturition, when the excretion stops completely. The amount of oestrin present in the urine in the early stages of pregnancy is so small that the recognition of the hormone will not enable a diagnosis to be made any earlier than by a clinical examination.—J. A. Nicholson.

TECHNIQUE.

Koch, F. E. (1934). Einfache Anaerobezüchtung in Petrischalen. Zeresin-Verschluss – Trokenes – Pottasche-Pyrogallol – Wachstum von Leptothrix, Aktinomyzes, Fusiformis, Pneumosintes und anderen Anaerobiern. [**Easy Cultivation of Anaerobes in Petri Dishes**].—*Zlb. Bakt. I.* (*Orig.*). **132.** 358-365. 2 figs. [14 refs.]

In this technique oxygen is absorbed by alkaline pyrogallol applied in a dry form on blotting paper slipped between the two halves of the petri dish which are then sealed with ceresin (a mineral wax). The method served for the isolation of delicate anaerobes such as *Actinomyces necrophorus*.—E. J. Pullinger.

Bachmann, W. (1934). Experimenteller Beitrag zur anaeroben Oberflächenkultur. I. Mitteilung. [**Experiments on the Surface Culture of Anaerobes. Part I**].—*Zlb. Bakt. I.* (*Orig.*). **132.** 366-378. 1 table. [8 refs.]

Types of yeast, *Bact. coli* and *Chromobact. prodigiosum* were compared with regard to their capacity for absorbing oxygen when used for producing anaerobic conditions in a Fortner plate. *Chr. prodigiosum* proved the most satisfactory for this purpose, whilst blood agar or unfiltered Levinthal agar were suitable media. Further information was obtained of the comparative value of *Chr. prodigiosum*, alkaline pyrogallol and sodium sulphide as oxygen absorbing agents. *Chr. prodigiosum* acting alone is unreliable. Alkaline pyrogallol gave satisfactory results acting along or in conjunction with the bacteria. Sodium sulphide was not satisfactory alone, but in conjunction with *Chr. prodigiosum* gave good results. The inclusion of glucose in blood agar for anaerobic culture tended to produce a browning of the medium.—E. J. Pullinger.

Hruszek, H. (1934). Ueber ein Miniatur-Kulturverfahren zum Stadium des makro- und mikroskopischen Wachstums der pathogenen Hautpilze. [**Miniature Culture Methods for the Study of the Macroscopic and Microscopic Growth of Pathogenic Fungi**].—*Zlb. Bakt. I.* (*Orig.*). **132.** 378-380. 1 fig.

The early development of cultures of fungi can be studied microscopically by growing the organism on a thin film of medium lying in the hollow of a cavity slide. If the slide is placed in a sterile petri dish and a little sterile water is added to prevent drying out, it can be incubated and subsequently examined without distortion of the colony by a cover-slip.—E. J. Pullinger.

KELLER, A. E. (1934). **A Comparison of the Efficiency of the Stoll Egg-Counting Technique with the Simple Smear Method in the Diagnosis of Hookworm.** —*Amer. J. Hyg.* **20.** 307-316. 5 tables. [2 refs.]

As a result of this comparison, which was made on 2,412 specimens of faeces, the author was able to show that the small drop dilution egg-counting method described by STOLL and HAUSHEER (1923), a description of which is given in the present paper, is more efficient than the direct smear method. What is of greater interest, however, is that he was able to obtain some indication of the number of eggs per g. of faeces represented by various counts obtained by the direct smear. It was found that from one to five eggs per slide represented 1,690 eggs per g. of faeces, six to 25 eggs per slide represented 4,190 eggs per g., 26 to 40 eggs per slide represented 12,325 eggs per g., and 41 or more eggs per slide represented 23,100 eggs per g. The lowest level of infection at which the direct smear method is of value for practical diagnostic purposes was found to be that represented by 1,200 eggs per g. of faeces.

The smears were prepared by mixing sufficient human faecal material with water to make a smear through which it was possible to read small print when the smear was covered by a 25 mm. square cover glass.

[It is clear that this standard may have different values for the various farm animals, but the results do give some indication of the correlation between the egg-count and the examination of a direct smear].—E. L. TAYLOR.

KERNKAMP, H. C. H., & DONHAM, C. R. (1934). **Comparative Values of Haemoglobin Determinations on Porcine Blood by the Tallquist, Dare, and Newcomer Methods (with Graphs for Conversion).**—*Cornell Vet.* **24.** 254-259. 2 charts.

The authors discuss the importance of haemoglobinometry to the veterinary practitioner. This is seen particularly in studying the anaemia of young pigs. In the Tallquist and the Dare methods of estimating haemoglobin the results are expressed as percentages of an arbitrary standard. In the Newcomer method the figures given represent grams of Hb per 100 c.c. of blood. This is considered more accurate and, as there is a trend to record results in these terms, conversion charts are given to show the relationship between the Newcomer figures and those given by the other two methods. Bloods were drawn from the ear veins of 266 pigs of varying ages and conditions, and the Hb in each case estimated by the three methods. The two scatter diagrams show a wide spread, but the authors consider the figures to be near enough for clinical purposes. No technique is given.—HENRY DRYERRE.

MISCELLANEOUS.

LORD BLEDISLOE. (1934). **The Importance of the Veterinary Profession to New Zealand.**—*Vet. Rec.* **14.** 1281-1285. 1 photograph.

Swine fever was stamped out in New Zealand in 1902 and no further outbreak occurred until 1933, when it was again quickly eradicated. Anthrax due to the use of imported bone manure has no longer been troublesome since the introduction of an effective system of sterilization. Blackleg is well under control. The percentage of cattle affected with tuberculosis is probably one-tenth of that in Great Britain, and the entire eradication of the disease should be aimed at. Mastitis affects 5 per cent. of cows, and contagious abortion 30 per cent. Sterility accounts for an economic loss represented by 10 to 15 per cent. of butter and cheese produced, abortion for 2·5 per cent. and mastitis for 5 per cent. ; this is equivalent to an

aggregate loss of between £2,000,000 to £2,500,000 *per annum*. Deficiency diseases account for the loss of 200,000 lambs annually. It would be to the interest of farming if private veterinary practice were more extended, especially in dairy farming districts.—F. Bullock.

Campbell, D. M. (1934). **Development of Veterinary Medicine in North America. Eighth Instalment. II – The First Period – 1790 to 1850.**—*Vet. Med.* **29.** 488-492. [For abst. of previous articles of this series see this *Bull.* **4.** 788].

This section of Campbell's history describes a revised edition of Gervase Markham's "Maisterpeece," entitled "The Citizen and Countryman's Experienced Farrier by J. Markham, G. Jefferies and Experienced Indians", published in Baltimore in 1803. Jefferies was responsible for the last 75 pages of this volume of 420 pages, but there is nothing original even in this part.—F. Bullock.

Schmaltz. (1934). Standesgeschichtliche Rückblicke. III. Die Entstehung der tierärztlichen Wissenschaft und ihrer Literatur. [**The Advance of Veterinary Science and its Literature**].—*Berl. tierärztl. Wschr.* **50.** 683-688. 1 photograph. [17 refs.] [For abst. of previous articles of this series, see this *Bull.* **4.** 787].

This section gives a hurried recapitulation of the outstanding dates and names of authors of treatises in veterinary science in antiquity, during the middle ages, and up to the 18th century. These early works, have, as Schmaltz avows, nothing to do with the development of modern veterinary science, for with the foundation of the veterinary schools a completely new start was made. From then onwards Schmaltz reviews in greater detail the more renowned of the German writers in every branch of veterinary medicine and surgery, and a brief account is given of the more important discoveries. The 17 references are to German works on food inspection.—F. Bullock.

—. (1934). Tchécoslovaquie. L'Institut vétérinaire national d'Ivanovice na Hané. [**Czechoslovakia : the National Veterinary Institute at Ivanovice na Hané**].—*Bull. Off. internat. Epiz.* **7.** 1246-1250.

Glanders occurs only in Slovakia and Ruthenia. Cases of rabies have dropped from 1,423 in 1922 to 79 in 1933. Anthrax, blackleg, foot and mouth disease and epizootic abortion are, however, rife. A formol vaccine is used with success for swine fever, and for anthrax the new vaccine (glucoside culture) has given excellent results [see this *Bull.* **4.** 497].

The Institute has five departments besides a sero-therapeutic section. The staff includes eight veterinarians, eight assistants, two clerks and a service staff of 40. About 15,000 specimens are examined annually and 14,000 litres of vaccines are produced.—F. Bullock.

Marcenac. (1933). L'Enseignement de l'Ophtalmologie à l'Ecole d'Application de Saumur. [**Training in Ophthalmology at the Ecole d'Application at Saumur (France)**].—*Rev. vét. milit.* **17.** 349-391.

This is, strictly speaking, the syllabus of a special course of instruction in ophthalmology for veterinarians of the French army. Actually, however, it is considerably more than this because of the vast amount of detail it contains. The procedure for the examination of every portion of the eye and its appendages is laid down in full. Methods of restraint and descriptions of the apparatus recommended as aids in examination are included. Of the 12 parts into which the syllabus is divided, 11 are devoted to diagnosis and to differentiation between

anomalies and lesions. The 12th is concerned with therapeutics and takes the form of lists of medicaments and surgical operations with which the student is expected to familiarize himself.

The course is essentially a practical one. The student is taken systematically, lesson by lesson, through all the structures of the eye. In each case the normal is first considered, followed by clinical study of the abnormal and pathological. The whole constitutes a valuable contribution to training in equine ophthalmology.
—C. DAVENPORT.

GORDON, J., & KNOX, J. C. (1934). **Further Investigations on the Bactericidal Properties of Adrenal Extracts.**—*J. Path. Bact.* **39.** 609-616. 1 fig., 3 tables. [5 refs.]

An aqueous extract prepared from the adrenal gland, especially from the medulla, shows a marked bactericidal action on a number of organisms if the extract is exposed to air either during preparation or subsequently. Partially oxidized adrenaline is probably the chief active constituent of the bactericidal extracts. *Corynebact. diphtheriae* and *Vibrio cholerae* were the most sensitive organisms used. One aspect of interest concerns the possible importance of oxidation products of adrenaline as bactericidal agents in the animal body, although it is at the moment difficult to see how oxidized adrenaline has any direct bactericidal activity in the blood because inactivation of both extracts and adrenaline solutions can be effected by the addition of either blood or serum.—R. LOVELL.

I. MARCENAC. (1934). L'arme bactériologique dans les guerres modernes. [**Employment of Micro-Organisms as a Weapon in Modern Warfare**].—*Rev. vét. milit.* **18.** 301-323. [11 refs.] [Paper presented at a conference of officers of the reserve of the military region of Paris (France) at the Ecoles de Perfectionnement].

II. VELU. (1934). La Prophylaxie contre les Maladies épizootiques et la guerre microbienne. [**Prevention of Infectious Animal Diseases and Microbial Warfare**].—*Ibid.* 325-336.

I. This is a lengthy discourse on the employment of disease-producing organisms in future warfare as a means of reducing the effectiveness of enemy forces, and of causing demoralization within enemy territory. As far as animals are concerned, the organisms most likely to be selected for dissemination are those of glanders [*Pfeifferella mallei*] and anthrax [*Bacillus anthracis*] for horses, and the viruses of foot and mouth disease, rinderpest, and bovine pleuro-pneumonia for slaughter stock intended for the feeding of troops. A number of cases of attempts to utilize this weapon in the European war of 1914 to 1918 are described. The international conventions governing this method of warfare are reviewed at some length.

II. This article contains little of an original nature. It reviews existing veterinary sanitary-police measures and considers in some detail their success, limitations and failures. The danger of micro-organisms being used as a weapon in future warfare is discussed.—C. DAVENPORT.

—. (1934). Přehled operativni činnosti vojenskych veterinářů v roce 1933. [**Survey of the Surgical Operations Performed by Army Veterinary Surgeons in 1933**].—*Vojen. Vet.* **3.** 72-74. 1 table.

A tabulated statistical report on surgical operations done on army horses in Czechoslovakia. Some 5,000 operations are recorded collectively.
—E. PRIBYL (BRNO).

OFFICIAL AND OTHER REPORTS.

GREAT BRITAIN. (1934). **On the State of the Public Health. Annual Report of the Chief Medical Officer of the Ministry of Health for the Year 1933.** [NEWMAN, G.] pp. 295. 98 tables, 2 charts. [Numerous refs.] London: H.M. Stat. Off. [8vo] [4s. 6d.]

Of veterinary interest is the review of the progress made since the introduction of the Milk (Special Designations) Order ten years ago. There are now 239 Licensed Certified Milk Farms, 289 Grade A (T.T.) Milk Farms, and 210 Pasteurized Milk Bottling Establishments. With certain adjustments there is a net increase of 55 Certified and Grade A (T.T.) Milk licences.

During the year 18,000 cattle were tested. The attention of veterinary surgeons is again drawn to the need for close adherence to the standard of technique and the interpretation of results described in the (1925). *Rep. med. Res. Coun., Lond.* No. 94 and (1928). *Rep. med. Res. Coun., Lond.* No. 122. In 16 cases a special retest of the herd was carried out by the consulting veterinary officer in collaboration with the local veterinary practitioner. In eight cases the findings at the retest diverged considerably from those of the local veterinary practitioner.

UNDULANT FEVER [*Br. abortus* INFECTION IN MAN].—The need for full collaboration between the medical and veterinary professions for the elaboration of this group of infections becomes daily more apparent, and it is therefore gratifying to find that the veterinary profession is taking an increasing interest in the relationship of bovine contagious abortion to undulant fever in man. In 149 cases of undulant fever in man, raw milk or cream had been consumed in 144 cases, of which 40 were definitely due to bovine infection. In 96 cases there was no confirmatory evidence of infection of the milk or cream. Two of the patients drank Certified Milk, three drank Grade A (T.T.) Milk, and four drank Grade A Milk. Consumers of such milk are probably as liable to contract undulant fever as if they drank non-designated milk. Pasteurization is the only safeguard.

MEAT INSPECTION.—The inspection of meat is very unsatisfactory. The difference in the amount of meat condemned in different districts is probably due to differences in the thoroughness of the inspection. The working of the Humane Slaughtering of Animals Acts, 1933, is approved and the advantages of the stunning of animals by electricity are well described.—F. BULLOCK.

GREAT BRITAIN. (1934). **Report of the Governing Body of the Lister Institute of Preventive Medicine.** pp. 22. [4to].

The research work of the Institute is chiefly concerned with human diseases and biochemical research, but much of it is of comparative interest and certain animal disease problems are dealt with.

A cell-free extract of chick embryo or of adult rabbit kidney stiffened by the addition of hen plasma and agar was found by Dr. EAGLES suitable for the cultivation of vaccinia virus from washed elementary bodies. " Louping ill " virus was successfully grown by D. W. HENDERSON on a medium comprising whole mouse embryo pulp, sheep serum and Tyrode solution.

An immunological study of fowl pox and pigeon pox was made by Dr. FINKELSTEIN.

" Hyperimmune sera have been prepared by infecting fowls with fowl-pox and pigeon-pox over lengthy periods. Macroscopic agglutination tests carried out at 55° C. have shown that fowl-pox sera agglutinate pigeon-pox elementary body suspensions to a rather lower titre than the homologous suspensions. On the other hand, pigeon-pox hyperimmune sera have not so far been found to agglutinate fowl-pox elementary bodies.

" Pigeon-pox virus is being maintained both by pigeon passage and fowl passage and

any effect that the host may have on the response of the elementary bodies to hyperimmune sera in agglutination and agglutinin-absorption tests will be investigated."

The causal organisms of contagious bovine pleuro-pneumonia and agalactia were studied morphologically by Prof. LEDINGHAM and Dr. KLEINBERGER [this *Bull.* **4.** 725].

A start was made by Dr. YUSEF in investigating the precipitins of the pasteurella group for the purpose of differentiating the species.

The immunology of spore-bearing anaerobes was studied by HENDERSON and work on H and O antigens is described.

The National Collection of Type Cultures, of which Dr. ST. JOHN BROOKS is the Curator, is housed at the institute. Over 5,000 cultures of bacteria and fungi were received during the year for identification and as a result 200 new types were classified and added to the collection.

The biology of *Corynebact. pseudotuberculosis* (the cause of caseous lymphadenitis in sheep) was studied by Dr. CARNE and an attempt is being made to find a method of immunization.—J. E.

GREAT BRITAIN. (1934). **The Annual Report of the National Institute for Research in Dairying [Univ. Reading] for the Year 1933.** [KAY, H. D.] pp. 85. 10 tables. Reading : Charles Elsbury & Son. [4to].

Apart from the usual sections relating to the financial position, the staff and the progress made during the year, which are essential to such a report, the main bulk of the publication consists of the reports of departments of which there are the following :– Dairy Husbandry, Chemical, Bacteriological, Dairy Bacteriological Advisory, Physiological and Experimental Dairy.

The problems investigated cover a wide field and, whereas the great majority are related directly to the production of milk in all its aspects and to the manufacture of cheese and dairy products, it is only to be expected that disease questions present themselves from time to time and demand attention.

Records of the causes of removal of cows from dairy herds, covering a cow population of 14,000, were collected and the results showed that disease played a very prominent role in this respect. Data with regard to the presence of *Br. abortus* agglutinins in the milk and blood of cows in Grade A (T.T.) herds was obtained. Of 233 milk samples, 14 showed a titre of 1 : 80 or over. It was not possible by cultural methods and animal inoculation experiments to isolate the organism.

The viability of *Mycobact. tuberculosis* in dung and soil was investigated by the Department of Bacteriology. It was shown to persist up to the 178th day under the summer conditions of 1931. Research work was also carried out with regard to high-temperature short-time pasteurization and its concomitant effects upon milk. The problem of milk secretion, like those of " low solid not fat " and the variation in the vitamin content of milk, is of general interest and is receiving careful attention.

A summary of published papers is given towards the end of the report.

—N. S. BARRON.

INDIA. (1934). **Annual Administration Report of the Army Veterinary Service in India for 1933-34.** [MOSLEY, H. S.] pp. 10. 4 tables. Simla : Govt. Press. [8vo].

This report deals with all the army animals in India and Burma and three tables give the wastage from sickness and particulars of specific and non-specific diseases.

The main part of the report deals in brief sections with the particular diseases encountered. Strangles is receiving particular attention, a veterinary officer having been appointed for a special investigation, which is to extend over three years. Reference is also made to an outbreak of a nervous disease, with a death rate of 30 per cent., closely resembling equine encephalomyelitis [see this *Bull.* **5.** 17]. Eight cases of glanders were observed.

Important modifications in the serum-simultaneous method of inoculation against rinderpest were introduced, including the use of goat virus.—E. P. ARGYLE.

INDIA, ASSAM. (1934). **Report of the Civil Veterinary Department for the Year 1933-1934.** [SEN, G. P.] pp. 35. 11 tables. Shillong: Assam Govt. Press. [8vo] [8 annas] [9d.]

The technical staff consisted of the Superintendant, four veterinary inspectors and 57 veterinary assistant surgeons.

The incidence of epidemic diseases, save rinderpest, was less than in the previous year. In equines glanders was not reported, but surra occurred in four districts. Rinderpest, foot and mouth disease, haemorrhagic septicaemia, blackquarter and anthrax were the main diseases affecting cattle, of which the first named was the most prevalent.

Preventive inoculation against rinderpest included the serum-alone, the serum-simultaneous and the virus-alone methods. It is not stated what methods of inoculation were adopted in the case of anthrax, haemorrhagic septicaemia and blackquarter, but a considerable number of inoculations were conducted. The treatment of anthrax with arsenic was continued. It is stated that anthrax and haemorrhagic septicaemia were treated successfully with camphor, but no details are given. Johne's disease has been detected among imported animals, and the Veterinary Investigation Officer, recently appointed, has been entrusted to make a further investigation. It is interesting to note that up to the present no case has been detected in indigenous cattle.

The number of cases treated at the veterinary hospitals and the number of castrations performed continues to increase, although the number of staff remains stationary.

Certain breeding operations, including the maintenance of stud bulls, are described.—G. K. WALKER.

INDIA, CENTRAL PROVINCES AND BERAR. (1934). **Annual Report on the Working of the Civil Veterinary Department for the Year ending the 31st March, 1934.** [STIRLING, R. F.] pp. 16. 11 tables. Nagpur: Govt. Printer. [8vo] [Rs.1].

The technical staff consisted of the Director, an Assistant Director, 13 veterinary inspectors and 132 veterinary assistant surgeons. There are 103 veterinary dispensaries in the Province.

Rinderpest was very prevalent, the number of outbreaks recorded being 13,848, an increase over the previous year. Foot and mouth disease was especially rife, and anthrax prevailed in most of the districts. Haemorrhagic septicaemia and blackquarter seriously affected some of the districts. The greatest mortality occurred from rinderpest, as usual, though the incidence of the disease was distinctly less severe. Piroplasmosis, which is endemic, is becoming less prevalent owing, it is reported, to the increasing use of trypan blue. Preventive inoculation for cattle disease is being carried out on an increasing scale, and the year was marked by a further advance in the use of goat virus inoculation against rinderpest. The economic advantages of this method are popularizing its use, though its

absolute efficacy has still to be proved. A few cases of trypanosomiasis were reported in horses and cattle, and odd cases of strangles and tetanus. Preventive vaccination for rabies was given to one elephant, nine horses and seven dogs. There were two outbreaks of fowl cholera and six of fowl spirochaetosis.

The newly appointed Veterinary Investigation Officer was engaged in conducting enquiries regarding rinderpest, piroplasmosis, coccidiosis and other internal parasites. He has carried out some investigations concerning the occurrence of nasal granuloma in cattle.

Increasing confidence in the work of the department is reported and the subordinate staff were able to castrate a large number of useless bulls to the benefit of cattle breeding operations.—G. K. WALKER.

INDIA, UNITED PROVINCES. (1934). **Annual Report of the Civil Veterinary Department for the Year 1933-1934.** [MOHAMED, N.] pp. 22. 8 tables. Allahabad: Supt. Print. & Stat., U.P. [8vo] [Rs.1].

The technical staff consisted of the Director, three circle superintendants, 16 veterinary inspectors, two veterinary overseers and 196 veterinary assistant surgeons.

Two cases of glanders and 113 cases of surra were detected during the year. It is not stated in the report if, in the case of surra, drug treatment was adopted. Rinderpest was less severe than in the previous year, but there was an increase in the mortality from haemorrhagic septicaemia.

It is reported that the goat virus method of inoculation against rinderpest has proved to be economical, although varying results were obtained. Two cases of glanders, one case of anthrax and 113 cases of surra were reported in horses. Foot and mouth disease occurred in 41 districts of the province. 576 cases of blackquarter and 924 cases of anthrax were reported in cattle.

Experimental work on the control of fascioliasis in cattle with carbon tetrachloride was continued and beneficial results were obtained from the treatment of bursati and nasal granuloma with " antimosan ".

There were 47 stallions employed in the districts during the year and it is reported that the young stock continue to show improvement.

There was an increase of two in the number of hospitals and dispensaries which now amount to 173. The work done in the dispensaries is described in the report and much of it is given in tabular form.—G. K. WALKER.

GERMANY. (1934). Tierärztlicher Bericht für Württemberg. Zusammenfassend die Jahrgänge 1931 und 1932. [**Veterinary Report of Württemberg for 1931 and 1932**]. [VON OSTERTAG, R.] pp. 77. 8 tables. Stuttgart : Bareiss. [8vo].

A detailed report on the veterinary organization, the notifiable and other important diseases of animals, meat and milk inspection and the general state of the livestock industry in the province of Württemberg. During the period under review Ministerialdirektor von Ostertag was chief of the veterinary department. [He retired in 1933]. The number of veterinary surgeons in the province is 284.

DIAGNOSTIC SERVICE.—Anthrax, swine erysipelas, swine plague and fowl cholera were only confirmed in a few cases. Bovine contagious abortion showed a slight increase during the two years as judged by the agglutination tests carried out. Only one case of blackleg was confirmed.

Borna disease and equine infectious anaemia are prevalent in Württemberg.

NOTIFIABLE DISEASES.—Haemorrhagic septicaemia, glanders, dourine, rinderpest, contagious bovine pleuro-pneumonia, rabies, sheep pox and fowl plague

were not observed [some of these having of course been eradicated years ago] whilst anthrax and blackleg gave very little trouble.

The voluntary tuberculosis eradication scheme progressed and there was corresponding increase in cases diagnosed bacteriologically. Nearly 10,000 herds containing some 74,000 head of cattle were enrolled by the end of 1932.

Swine erysipelas was wide-spread and losses totalled about 700 pigs in 1931 and 400 pigs in 1932. Different types of vaccine-serum therapy were employed. A few cases of the infection being transmitted to human beings are recorded.

Swine plague and swine fever are treated collectively : losses were comparatively low.

Foot and mouth disease is present in the province and a succession of small outbreaks occurred during the period of the report. It is stated that, for control purposes, a five-day period of quarantine is too short, and that an incubation period of 17 days was observed in one case. Eradication by slaughter was carried out in a few suitable cases ; otherwise serum and virus, or serum alone were employed.

Borna disease caused the loss of 568 horses in 1931 and of 228 in 1932, 1931 being the peak year of losses since the disease was made notifiable in 1921. Its epidemiology is obscure. For a definite diagnosis, the clinical appearance, the *post-mortem* appearance and the histological findings in the brain are necessary. Preventive inoculation with a vaccine prepared from infected brain has been used rather widely and the reports were mostly favourable, though difficult to interpret in view of the somewhat peculiar yearly variation in incidence.

In 1931, 65 horses died of infectious anaemia and in 1932, 218 died, this being the peak figure of all hitherto obtained. As the clinical syndrome takes many weeks or even months to develop, the disease cannot be easily controlled, since, by the time it is diagnosed in a district, it is already well established.

Diagnosis is based on the syndrome, *post-mortem* appearance, histological examination of organs and on haematological tests. It is, however, often very difficult to make a definite diagnosis. There is no reliable non-specific method of treatment and reference is made to immunization. Suggestions for an improvement of veterinary police control measures are given.

Some 700 and 500 cases of sheep scab were notified in 1931 and 1932 respectively and a few cases of mange in horses were observed.

A few outbreaks of a venereal disease in horses and cattle (" Bläschenauschlag ") were reported.

Notes are also given on the many other infectious and sporadic diseases of domestic animals, on the food control service and on livestock breeding.—J. E.

BOOK REVIEWS.

Fleming, A. [F.R.C.S. (Eng.) Prof. Bacteriol., Univ. London] & Petrie, G. F. [M.D. (Aberd.) Bacteriol.-in-charge, Serum Department, Lister Inst., Elstree]. (1934). **Recent Advances in Vaccine and Serum Therapy.** pp. x + 463. 3 figs., 29 tables. [Numerous refs.] London : J. & A. Churchill. [8vo] [15s.]

The authors set themselves the task of making a survey of the present state of knowledge regarding the prophylactic and therapeutic employment of sera and vaccines. They have succeeded very well in covering a large part of a very wide field. The monograph occupies 463 pages and approaches very closely to text-book proportions. It is written mainly to inform the medical practitioner but, as

the authors rightly claim, an artificial division between the specific prophylaxis and treatment of human beings and of animals cannot be justified on logical grounds. Veterinary practitioners and bacteriologists will find much useful information in the book, but the two sections devoted to the employment of sera and vaccines in veterinary practice will be found to be rather too slight to make a special appeal to them.

The book is divided into two parts. The first part which is written by Petrie deals with serum therapy and occupies 19 chapters. In the first chapter, general consideration is given to the production and use of therapeutic sera. The following chapters are devoted to the serum treatment of specific diseases, including one on the vaccine and serum treatment of certain diseases in human beings caused by filter-passing viruses and another on the use of vaccines and sera in veterinary practice.

The second part, for which Fleming is responsible, deals with vaccine therapy and prophylaxis. The subject is dealt with in 25 chapters, for the most part each chapter being devoted to a separate disease. It may come as a surprise to some readers to find that no space is devoted to the subject of active immunization in tuberculosis.

References to the literature are given at the end of each chapter. These are numerous, cover much of the literature up to and including 1933 and form a valuable part of the book.

A sound, critical point of view is adopted by the authors. With the newer knowledge that is rapidly being acquired on the antigen-complex of bacteria and their products, the reasons for many of the past failures in vaccine therapy and prophylaxis are becoming apparent. It is unfortunate that the book should have been published just too early to include any reference to the recent work of FELIX and his co-workers on the virulence antigen of the typhoid bacillus, work which may lead to important advances in our knowledge of bacterial antigens.

We trust that in the next edition of the book the authors, having in this edition given a wide general survey of the subject, will be able to devote themselves more particularly to the most recent advances in the subject and reduce the number of pages.

The book is a valuable addition to the very useful series of monographs, " The Recent Advance Series," published by J. & A. Churchill.—L. B. BULL.

SHARPEY-SCHAFER, E. [F.R.S.] (1934). **Essentials of Histology. Descriptive and Practical.** [Edited by H. M. Carleton]. pp. x+618. 721 figs. London, New York & Toronto : Longmans, Green & Co. [13th Edit.] [8vo] 15s.]

The popularity of this book, which is now in its 13th edition, is a great indication of its usefulness in the teaching of histology. It has been recommended by teachers and accepted as a standard book by medical and also by veterinary students in this country for many years. No great alterations have been made in the form or descriptive side. The majority of the figures have been retained, a few omitted and a small number of new illustrations added. Rather a notable addition in the latter group is a beautiful coloured illustration of the structure of the anterior lobe of the hypophysis. The section on blood and haematopoiesis has been rewritten in order to give the beginner a fairly clear idea of one modern view on the development of the cells of the blood (based on the work of SABIN, CUNNINGHAM and DOAN). The appendix contains a short but concise account of special and general histological technique. The book is essentially a descriptive and practical text-book for students and is not intended to replace such a valuable reference book as that by MAXIMOV.—J. R. M. INNES.